ORDER NO. SD83082633A2

Service Manual

Stereo Integrated DC Amplifier

SU-V707/SU-V707(K)

[EGA]

* The colors of this model include silver and black.
* The black type model is provided with (K) in the Se

iA] is available in F.R. Germany.

Please use this manual together with the service manual for Model No. SU-V707/(K), Order No. SD83032414C9.

CHANGES

■ REPLACEMENT PARTS LIST

Notes: (1) Mentioned in this parts list are only those changed in Model No. SU-V707/(K) for destination [E] area.
(2) Important safety notice: Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
(3) The " Ⓢ " mark is service standard parts and may differ from production parts.

Ref. No.	Change of Part No.		Part Name & Description	Per Set (Pcs.)	Remarks
	SU-V707/(K) [E]	SU-V707/(K) [EGA]			
COILS					
L1, 2	Addition	ELQ050D15	Choke	2	
L351~354	Addition	SLQY07G-30	Choke	4	
TRANSFORMER					
T1	SLT5P229	SLT5P231	Power Source	1	⚠
COMPONENT COMBINATION					
Z151, 152	Addition	SLM1Z33	L.P.F.	2	
LAMPS					
PL1~3	XAMR74S10	XAMR74S17	New Class A, 12V, 0.055A	3	
FUSES					
F1	XBA2C50TRO	XBA2C25TRO	250V, T2.5A	1	⚠
F2	XBA2C25TRO	Abolition	----------	0	
SWITCH					
S11	ESE37219	Abolition	----------	0	
RESISTORS					
R251~258	Addition	ERD25FJ272	Carbon, 2.7kΩ, 1/4W	8	Ⓢ
R151~154	Addition	ERD25FJ122	Carbon, 1.2kΩ, 1/4W	4	Ⓢ
CAPACITORS					
C131~134	Addition	ECCD1H101K	Ceramic, 100pF, 50V	4	Ⓢ
C251, 252	Addition	ECCD1H121K	Ceramic, 120pF, 50V	2	Ⓢ
C351~354	Addition	ECKD1H471KB	Ceramic, 470pF, 50V	4	Ⓢ
C355~358	Addition	ECKD1H102MD	Ceramic, 0.001μF, 50V	4	Ⓢ
C359	Addition	ECKD1H333ZF	Ceramic, 0.033μF, 50V	1	Ⓢ
CABINET and CHASSIS PARTS					
26	SJA97	SJA138-3	AC Cord	1	Ⓢ ⚠
27	SGPUV707B	SGPUV707G	Rear Panel	1	
ACCESSORY					
A4	SQF11703	SQF11705	Instruction Book	1	

Technics

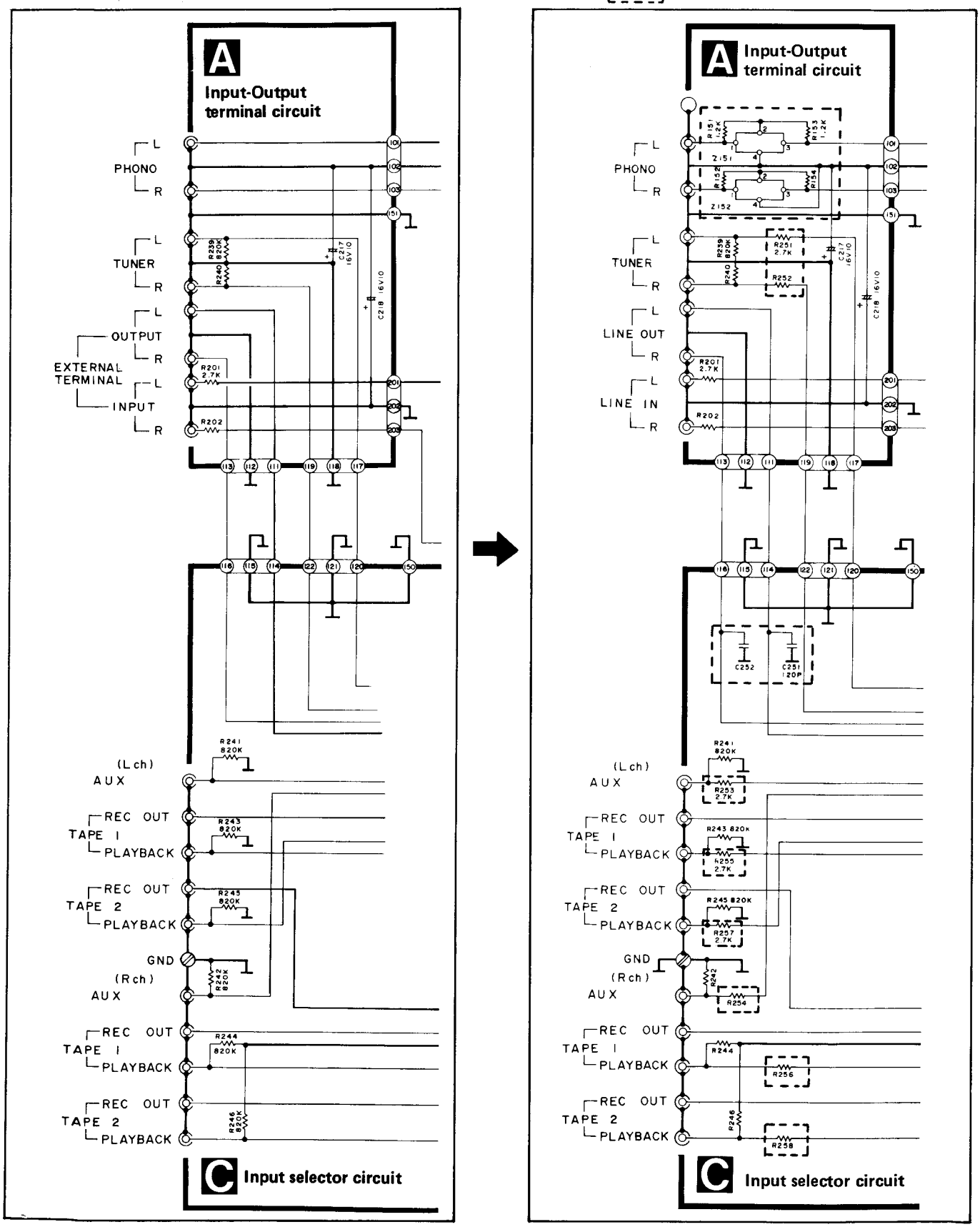
Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

■ SCHEMATIC DIAGRAM

SU-V707/(K)-[E] change SU-V707/(K)-[EGA]

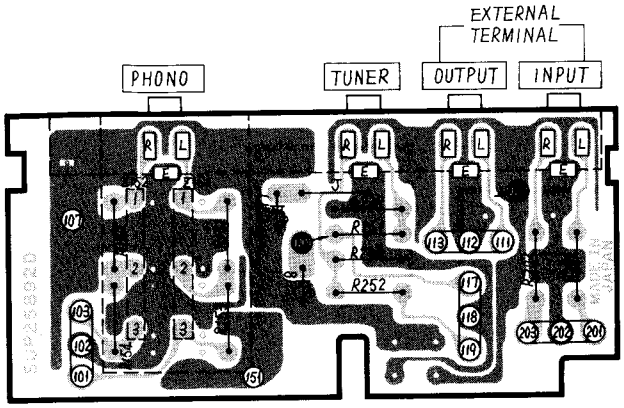
● Input-Output terminal circuit

Addition parts

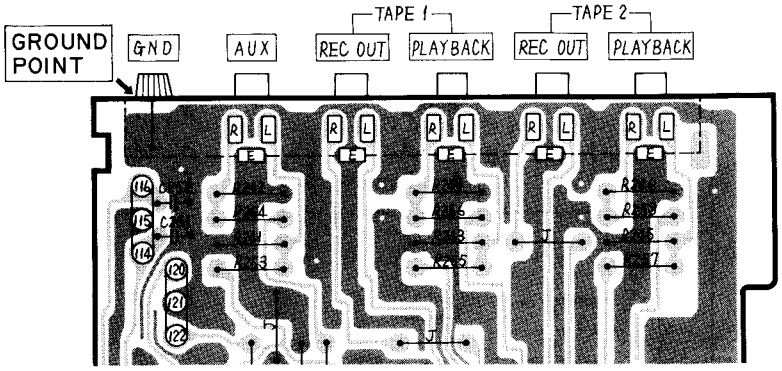


■ ADDITIONAL PARTS OF PRINTED CIRCUIT BOARD

A Input-Output circuit



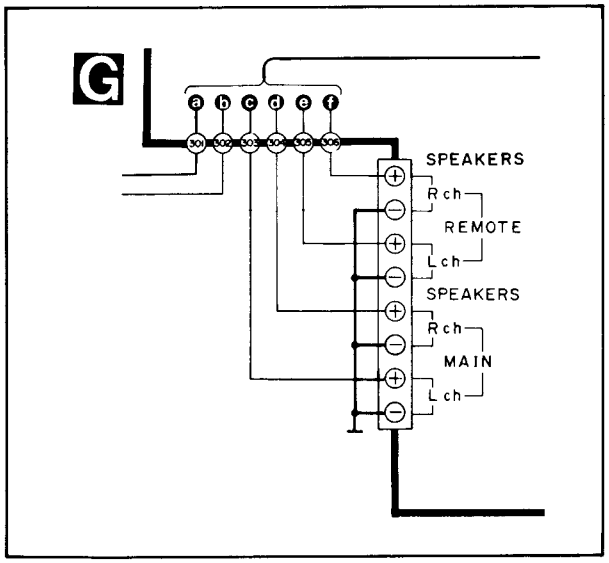
C Input selector circuit



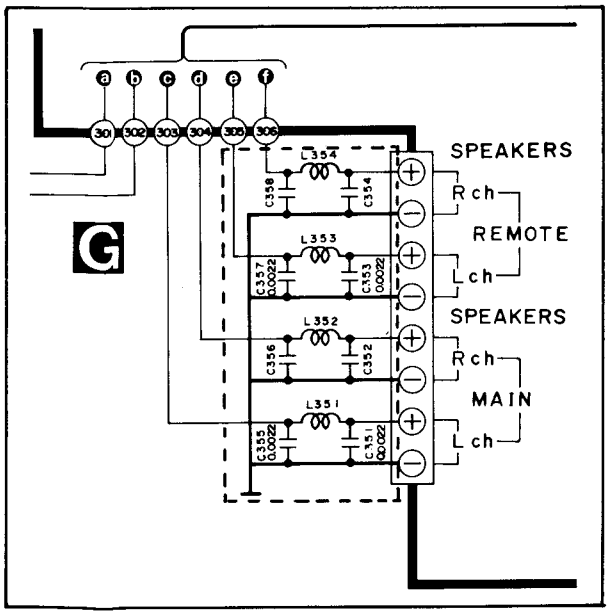
• Speaker terminal

SU-V707/(K)-[E]

Addition parts



change ⬇ SU-V707/(K)-[EGA]



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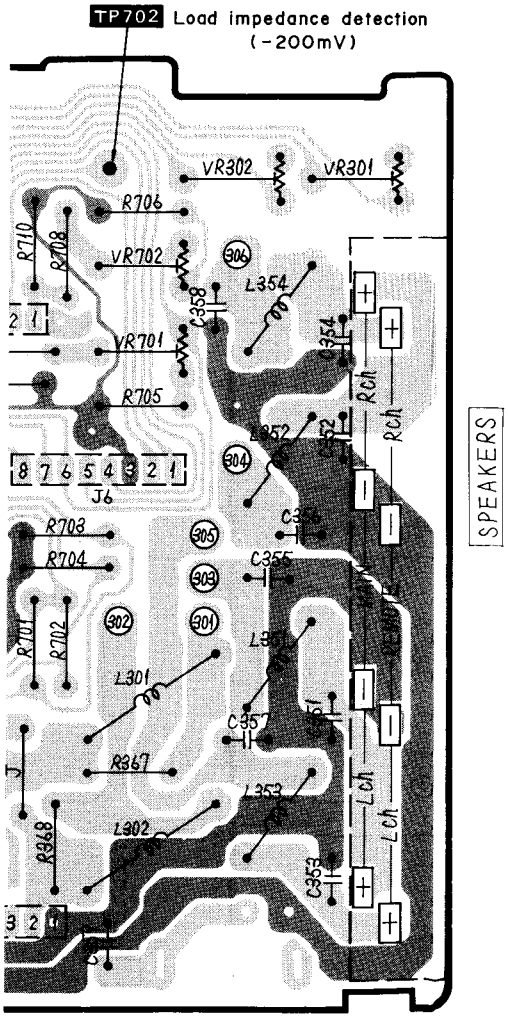


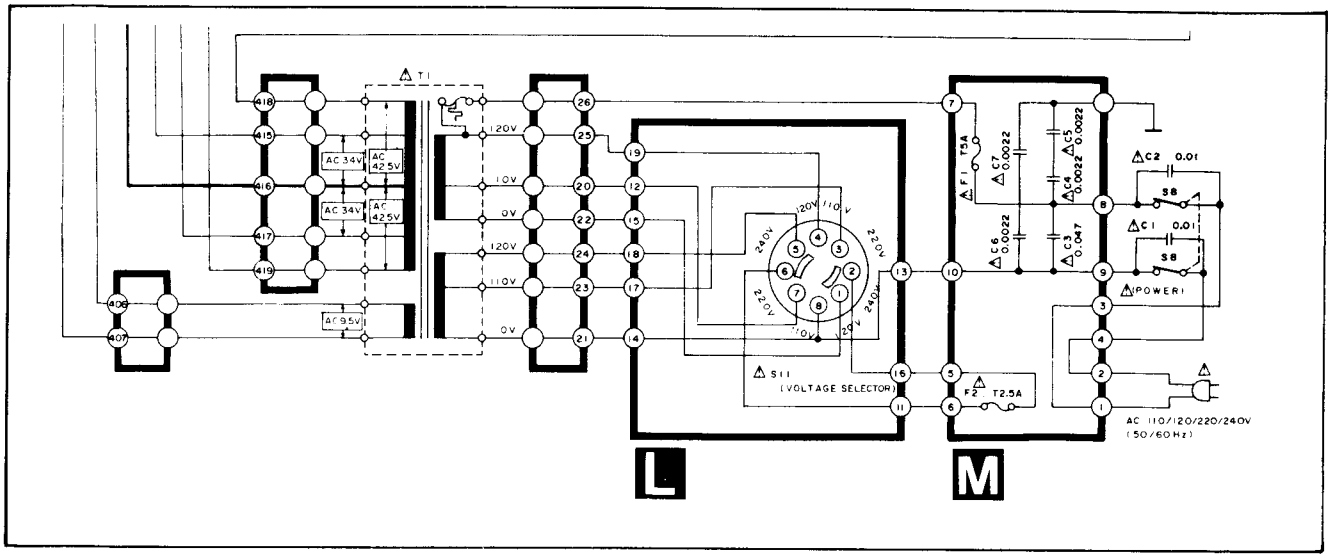
SU-V707

■ SCHEMATIC DIAGRAM

• Power source circuit

Addition parts

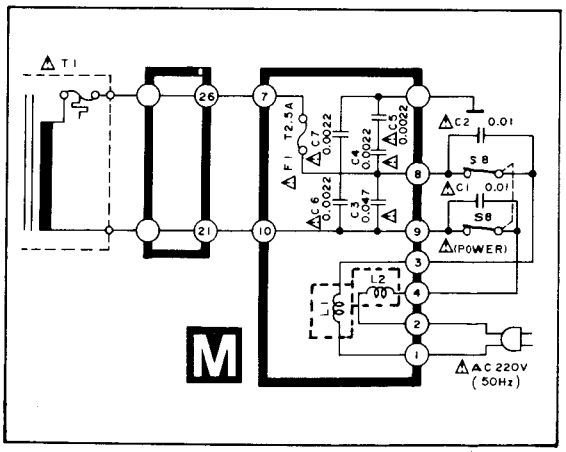
SU-V707/(K)-[E]

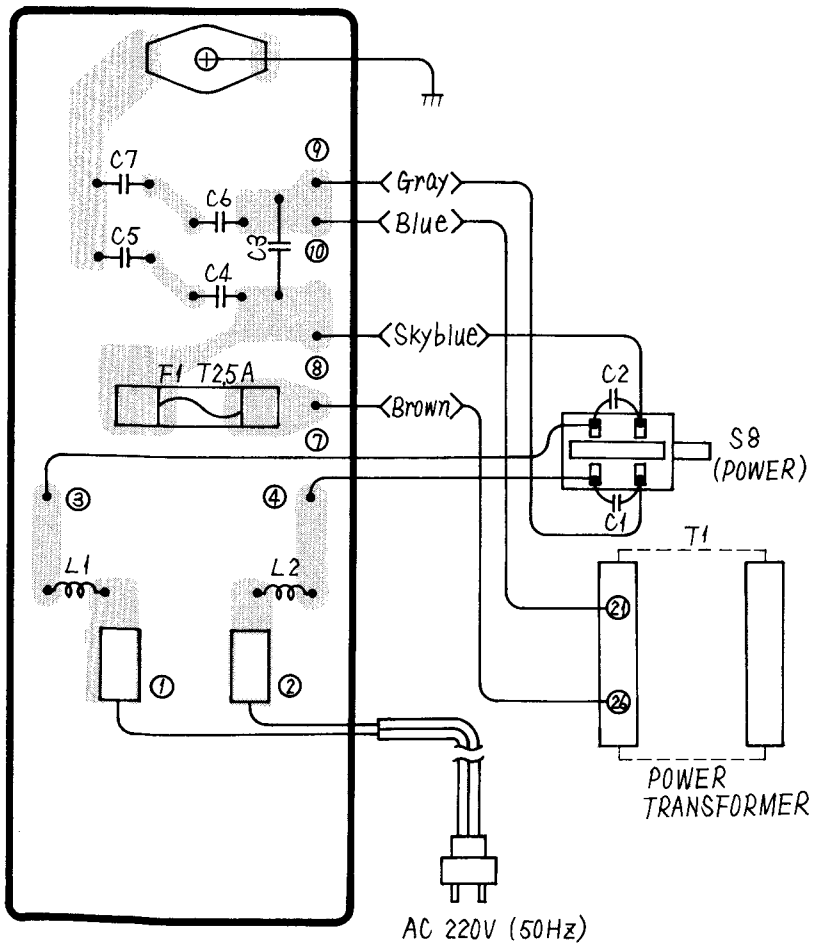


change

■ ADDITION PARTS OF PRINTED CIRCUIT BOARD

SU-V707/(K)-[EGA]





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ORDER NO. SD83032414C9

Service Manual

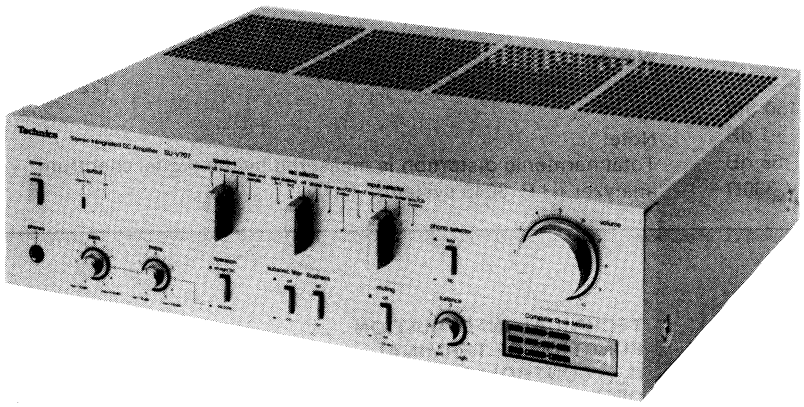
Stereo Integrated DC Amplifier

SU-V707

[D],[EW],[EK],[XL],[XA],[PA], [PE], [EF],[EH],[EB],[Ei]

SU-V707(K)

[D],[EW],[EK],[XA],[EF],[EH], [EB],[Ei]



* The colors of this model include silver and black.
* The black type model is provided with (K) in the Service Manual.

Areas

*[D]	is available in Scandinavia.
*[EW]	is available in Switzerland.
*[EK]	is available in United Kingdom.
*[XL]	is available in Australia.
*[XA]	is available in Southeast Asia, Oceania, Africa, Middle Near East and Central South America.
*[PA]	is available in Far East PX.
*[PE]	is available in European Military.
*[EF]	is available in France.
*[EH]	is available in Holland.
*[EB]	is available in Belgium.
*[Ei]	is available in Italy.

Specifications (Specifications are subject to change without notice for further improvement.)

(DIN 45 500)

■ AMPLIFIER SECTION

20 Hz~20 kHz continuous power output	
both channels driven	2 × 80W (4Ω)
	2 × 90W (8Ω)
40 Hz~16 kHz continuous power output	
both channels driven	2 × 80W (4Ω)
	2 × 90W (8Ω)
1 kHz continuous power output	
both channels driven	2 × 80W (4Ω)
	2 × 90W (8Ω)
Total harmonic distortion	
rated power at 20 Hz~20 kHz	0.007% (4Ω)
	0.003% (8Ω)
rated power at 40 Hz~16 kHz	0.007% (4Ω)
	0.003% (8Ω)
rated power at 1 kHz	0.0015% (4Ω)
	0.001% (8Ω)
half power at 20 Hz~20 kHz	0.002% (8Ω)
half power at 1 kHz	0.001% (8Ω)
−26 dB power at 1 kHz	0.01% (4Ω)
50 mW power at 1 kHz	0.01% (4Ω)
Intermodulation distortion	
rated power at 250 Hz: 3 kHz=4:1, 4Ω	0.01%
rated power at 60 Hz: 7 kHz=4:1, SMPTE, 8Ω	0.007%
Power bandwidth	
both channels driven, −3 dB	5 Hz~70 kHz (4Ω, 0.03%)
	5 Hz~70 kHz (8Ω, 0.02%)
Residual hum and noise	0.5 mV
Damping factor	30 (4Ω), 60 (8Ω)
Input sensitivity and impedance	
PHONO MM	2.5 mV/47kΩ
MC	170 μV/220Ω
TUNER	150 mV/18kΩ
AUX/CD/VIDEO	150 mV/18kΩ
TAPE 1	150 mV/18kΩ
TAPE 2	150 mV/18kΩ
PHONO maximum input voltage (1 kHz, RMS)	
MM	210 mV
MC	15 mV
S/N	
rated power (4Ω)	
PHONO MM	78 dB (88 dB, IHF, A, 2.5 mV input)
MC	72 dB (72 dB, IHF, A, 250 μV input)
TUNER	93 dB (IHF, A, 104 dB)
AUX/CD/VIDEO, TAPE	93 dB (IHF, A, 104 dB)
−26 dB power (4Ω)	
PHONO MM	72 dB
MC	68 dB
TUNER	74 dB
AUX/CD/VIDEO, TAPE	74 dB
50 mW power (4Ω)	
PHONO MM	68 dB
MC	67 dB
TUNER	69 dB
AUX/CD/VIDEO, TAPE	69 dB

Technics

Panasonic Tokyo
Matsushita Electric Industrial Co., Ltd.
1-2, 1-chome, Shiba-koen, Minato-ku, Tokyo 105 Japan

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

Frequency response	
PHONO	RIAA standard curve ±0.5 dB (30 Hz~15 kHz)
TUNER	0.7 Hz~140 kHz (−3 dB) +0 dB, −0,2 dB (20 Hz~20 kHz)
AUX/CD/VIDEO, TAPE	0.7 Hz~140 kHz (−3 dB) +0 dB −0.2 dB (20 Hz~20 kHz)
Tone controls	
BASS	50 Hz, +10 dB~ −10 dB
TREBLE	20 kHz, +10 dB~ −10 dB
Subsonic filter	30 Hz, −6 dB/oct.
Loudness control (volume at −30 dB)	50 Hz, +9 dB
Muting	−20 dB
Output voltage	
REC OUT	150 mV
Channel balance, AUX/CD/VIDEO 250 Hz~6,300 Hz	±1 dB
Channel separation, AUX/CD/VIDEO, 1 kHz	55 dB
Headphones output level and impedance	630 mV/330Ω

Load impedance	
MAIN or REMOTE	4Ω~16Ω
MAIN and REMOTE	8Ω~16Ω

■ GENERAL

Power consumption	510W
Power supply	AC 50 Hz/60 Hz, 110V/120V/220V/240V
Dimensions (W×H×D)	430 × 120 × 362 mm (16-15/16" × 4-23/32" × 14-1/4")
Weight	10 kg (22 lb.)

Note:
Total harmonic distortion is measured by the digital spectrum analyzer (H.P. 3045 system).

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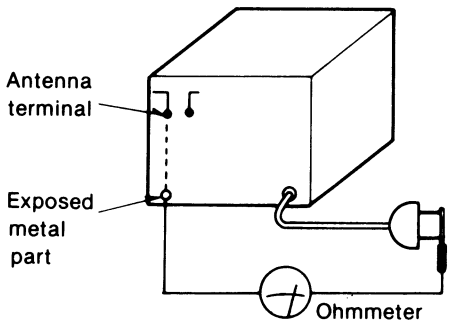
■ SAFETY PRECAUTION

1. Before servicing, unplug the power cord to prevent an electric shock.
2. When replacing parts, use only manufacturer's recommended components for safety.
3. Check the condition of the power cord. Replace if wear or damage is evident.
4. After servicing, be sure to restore the lead dress, insulation barriers, insulation papers, shields, etc.
5. Before returning the serviced equipment to the customer, be sure to make the following insulation resistance test to prevent the customer from being exposed to a shock hazard.

• INSULATION RESISTANCE TEST

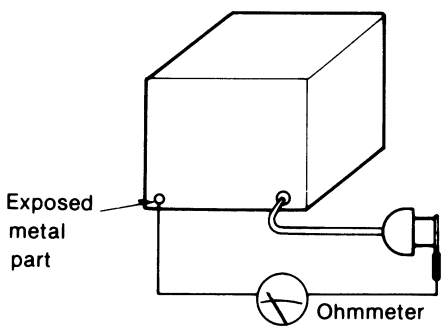
1. Unplug the power cord and short the two prongs of the plug with a jumper wire.
2. Turn on the power switch.
3. Measure the resistance value with ohmmeter between the jumpered AC plug and each exposed metal cabinet part, such as screwheads antenna, control shafts, handle brackets, etc. Equipment with antenna terminals should read between 3MΩ and 5.2MΩ to all exposed parts. (Fig. A) Equipment without antenna terminals should read approximately infinity to all exposed parts. (Fig. B)

Note: Some exposed parts may be isolated from the chassis by design. These will read infinity.



(Fig. A)

Resistance = 3MΩ—5.2MΩ



(Fig. B)

Resistance = Approx ∞

4. If the measurement is outside the specified limits, there is a possibility of a shock hazard. The equipment should be repaired and rechecked before it is returned to the customer.

ORDER NO. SD83032414C9–A

Stereo Integrated DC Amplifier SU-V707/SU-V707(K)

- This booklet contains the specifications and adjusting procedures for SU-V707, written Germany, French and Spanish.
- File this manual together with the SU-V707 service manual (Order No. SD83032414C9).

- Diese Broschüre enthält die technischen Daten und die Beschreibungen der Justiermethoden für SU-V707 in deutscher, französischer und spanisher Sprache.
- Bewahren Sie das Büchlein zusammen mit der Bedienungsanleitung für SU-V707 (Bestell-Nr. SD83032414C9) auf.

- Cette brochure contient les spécifications et les procédures de réglage pour le SU-V707, écrites en allemand, en français et en espagnol.
- Classer ce manuel en même temps qu'avec le manuel de service du SU-V707 (N° d'ordre : SD83032414C9).

- Este librito contiene las especificaciones y procedimientos de ajuste para SU-V707, escritas en alemán, francés y español.
- Guardar este manual juntamente con el manual de servicio de SU-V707 (Pedido N°. SD83032414C9).

DEUTSCH

■ TECHNISCHE DATEN (Spezifikationen Können infolge von Verbesserungen ohne Ankündigung geändert werden.)

(DIN 45 500)

■ VERSTÄRKERTEIL

Dauerton-Ausgangsleistung bei 20 Hz ~ 20 kHz
- **beide Kanäle ausgesteuert** 2 × 80W (4 Ω)
  2 × 90W (8 Ω)

Dauerton-Ausgangsleistung bei 40 Hz ~ 16 kHz
- **beide Kanäle ausgesteuert** 2 × 80W (4 Ω)
  2 × 90W (8 Ω)

Dauerton-Ausgangsleistung bei 1 kHz
- **beide Kanäle ausgesteuert** 2 × 80W (4 Ω)
  2 × 90W (8 Ω)

Gesamtklirrfaktor
- **Nennleistung bei 20 Hz ~ 20 kHz** 0,007% (4 Ω)
  0,003% (8 Ω)
- **Nennleistung bei 40 Hz ~ 16 kHz** 0,007% (4 Ω)
  0,003% (8 Ω)
- **Nennleistung bei 1 kHz** 0,0015% (4 Ω)
  0,001% (8 Ω)
- **halbe Nennleistung bei 20 Hz ~ 20 kHz** 0,002% (8 Ω)
- **halbe Nennleistung bei 1 kHz** 0,001% (8 Ω)
- **−26 dB Leistung bei 1 kHz** 0,01% (4 Ω)
- **50 mW Leistung bei 1 kHz** 0,01% (4 Ω)

Intermodulationsfaktor
- **Nennleistung bei 250 Hz: 8 kHz = 4:1, 4 Ω** 0,01%
- **Nennleistung bei 60 Hz: 7 kHz = 4:1, nach SMPTE, 8 Ω** 0,007%

Leistungsbandbreite
- **beide Kanäle ausgesteuert bei −3 dB**
  5 Hz ~ 70 kHz (4 Ω, 0,03%)
  5 Hz ~ 70 kHz (8 Ω, 0,02%)

Restbrumm und Geräusch 0,5 mV

Dämpfungsfaktor 30 (4 Ω), 60 (8 Ω)

Eingangsempfindlichkeit und -impedanz
- **Phono - magnetisch (PHONO MM)** 2,5 mV/47 kΩ
- **Phono - dynamisch (PHONO MC)** 170 μV/220 Ω
- **Tuner** 150 mV/18 kΩ
- **AUX/CD/VIDEO** 150 mV/18 kΩ
- **Tape 1 (TAPE 1)** 150 mV/18 kΩ
- **Tape 2 (TAPE 2)** 150 mV/18 kΩ

Maximale TA-Eingangsspannung (1 kHz, eff.)
- **magnetisch (MM)** 210 mV
- **dynamisch (MC)** 15 mV

Geräuschabstand
- **Nennleistung (4 Ω)**
  - **Phono - magnetisch (PHONO MM)**
    78 dB (88 dB nach IHF, A, 2,5 mV Eingang)
  - **Phono - dynamisch (PHONO MC)**
    72 dB (72 dB nach IHF, A, 250 μV Eingang)
  - **Tuner** 93 dB (nach IHF, A: 104 dB)
  - **AUX/CD/VIDEO, TAPE** 93 dB (IHF, A: 104 dB)
- **−26 dB Leistung (4 Ω)**
  - **Phono - magnetisch (PHONO MM)** 72 dB
  - **Phono - dynamisch (PHONO MC)** 68 dB
  - **Tuner** 74 dB
  - **AUX/CD/VIDEO, TAPE** 74 dB
- **50 mW Leistung (4 Ω)**
  - **Phono - magnetisch (PHONO MM)** 68 dB
  - **Phono - dynamisch (PHONO MC)** 67 dB
  - **Tuner** 69 dB
  - **AUX/CD/VIDEO, TAPE** 69 dB

Frequenzgang
- **Phono** RIAA-Standardkurve
  ±0,5 dB (30 Hz ~ 15 kHz)
- **Tuner** 0,7 Hz ~ 140 kHz (−3 dB)
  +0 dB, −0,2 dB (20 Hz ~ 20 kHz)
- **AUX/CD/VIDEO, TAPE** 0,7 Hz ~ 140 kHz (−3 dB)
  +0 dB, −0,2 dB (20 Hz ~ 20 kHz)

Klangregler
- **Baßregler (BASS)** 50 Hz, +10 dB ~ −10 dB
- **Höhenregler (TREBLE)** 20 kHz, +10 dB ~ −10 dB

Tiefenfilter 30 Hz, −6 dB/Okt.

Gehörrichtige Lautstärkekorrektur (Loudness)
- **(bei −30 dB Ausgangsleistung)** 50 Hz, +9 dB

Tondämpfung −20 dB

Ausgangsspannung
- **Aufnahmeausgang (REC OUT)** 150 mV

Kanalabweichung (AUX/CD/VIDEO, 250 Hz ~ 6300 Hz) ±1 dB

Übersprechdämpfung (AUX/CD/VIDEO, 1 kHz) 55 dB

Kopfhörerpegel und -impedanz 630 mV/330 Ω

Lautsprecherimpedanz
- **MAIN oder REMOTE** 4 Ω ~ 16 Ω
- **MAIN und REMOTE** 8 Ω ~ 16 Ω

■ ALLGEMEINE DATEN

Leistungsaufnahme 510 W

Netzspannung
- **Für Deutschland** Wechselstrom 50 Hz/60 Hz, 220V
- **Für andere Länder** Wechselstrom 50 Hz/60 Hz, 110V/120V/220V/240V

Abmessungen (B×H×T) 430 × 120 × 362 mm

Gewicht 10 kg

Bemerkung:
Der Gesamtklirrfaktor wurde mit einem digitalen Rauschspektrometer (Anlage H.P. 3045) gemessen.

■ MESSUNGEN UND JUSTIERUNGEN

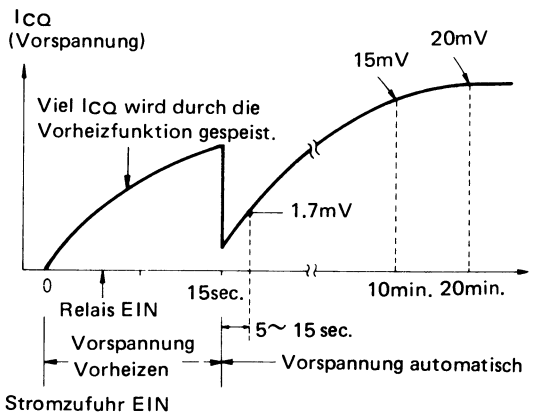
1. Justierung des Taktgebers (nach dem Auswechseln des Mikrocomputers)

(1) Die Stromzufuhr abschalten.
(2) VR501 so abgleichen, daß die Zeit bis zum Einschalten des Relais 5~7 Sekunden vom Einschalten der Stromzufuhr beträgt.
  * Wenn VR501 entgegen dem Uhrzeigersinn (in Richtung A) gedreht wird, verlängert sich die Zeit (Frequenz verringert sich).
  * Wenn VR501 im Uhrzeigersinn (Richtung B) gedreht wird verkürzt sich die Zeit (Frequenz erhöht sich).

(Anmerkung) Die Taktgeberfrequenz von 400kHz wird an TP501 erhalten. Im Falle eines gewöhnlichen Frequenzzählers und Oszilloskops kann die Frequenz aufgrund der Probenkapazität nicht korrekt gemessen werden. Es ist daher empfehlenswert, für die Servicearbeiten die obige Methode anzuwenden.

2. Justierung des Leerlaufs (ICQ) (nach Reparatur des Hauptverstärkers)

(1) Nach der Reparatur ist die Lautstärke auf Minimum einzustellen, bevor der Netzschalter eingeschaltet wird, und es sollte nichts an die Lautsprecheranschlüsse angeschlossen werden.
(2) Den ICQ–Regler (VR301, 302) vollständig entgegen dem Uhrzeigersinn drehen.
(3) Die an den Verstärker angelegte Spannung allmählich mit dem Spannungsregler erhöhen und vor Beginn der Justierung ist der Wert in der nachstehenden Tabelle zu überprüfen.
(4) Das elektronische Gleichstrom–Voltmeter an TP302 (+) und TP301 (–) (linker Kanal) oder TP304 (+) und TP303 (–) (rechter Kanal) anschließen.
(5) Nach Ablauf von 5 oder 15 Sekunden nach Aufleuchten von Computer Drive Monitor "auto", VR301 (linker Kanal) oder VR302 (rechter Kanal) auf 2mV abgleichen.
  * In diesem Gerät wird ICQ durch den Mikrocomputer gesteuert, und ICQ von ein wenig mehr als dem normalen Pegel wird durch "PREHEAT" während 15 Sekunden nach Einschalten der Stromzufuhr gespeist. Nachher werden der Ausgangspegel und die Transistortemperatur durch "AUTO" erfaßt, und dadurch wird ICQ automatisch gesteuert.



3. Justierung der Lastimpedanz–Detektionsschaltung (nach Reparatur der Lautsprecherimpedanz–Detektionsschaltung)

(1) Eine Last von 6,5Ω (1/2W, Kohlewiderstand) oder 3,3Ω und 3,3Ω (1/2W, ±5%) in Serieschaltung an die "main"–Lautsprecheranschlüsse anschließen.
(2) Den Lautsprecher–Wahlschalter in die "main"–Position stellen.
(3) TP601 mit dem Chassis verbinden.
(4) Ein Gleichstrom–Voltmeter zwischen TP701 und dem Chassis (L. Kanal) oder TP702 und Chassis (R. Kanal) anschlie en.
(5) VR701 (L.Kanal) so justieren, daß die Spannung von TP701 –200mV beträgt.
(6) VR702 (R.Kanal) so justieren, daßdie Spannung von TP702 –200mV betragt.

ANMERKUNG
Unbedingt zuerst VR702 (L. Kanal) vor VR701 (R. Kanal) justieren.

* Prüfungen der Schutzschaltung nach Reparatur und Justierung

• Prüfung der Stummschaltung beim Ein– und Ausschalten des Netzschalters

(1) Wechselstrom–Voltmeter und 8Ω–Last (Widerstand oder Lautsprecher an die Haupt–Lautsprecheranschlüsse anschließen.
(2) Die Lautstärke auf einen normalen Pegel einstellen.
(3) Signal von 1kHz, 100mV an den AUX–Eingangsanschluß anlegen.
(4) Überprüfen, daß die Ausgangsleistung 4~6 Sek. nach Einschalten des Netzschalters erreicht wird, und daß die Ausgangsleistung sofort beim Ausschalten der Stromzufuhr Null wird.

ORDER NO. SD83082633A2

Service Manual

Stereo Integrated DC Amplifier

SU-V707 / SU-V707(K)

[EGA]

* The colors of this model include silver and black.
* The black type model is provided with (K) in the Service Manual.

Area

* [EGA] is available in F.R. Germany.

Please use this manual together with the service manual for Model No. SU-V707/(K), Order No. SD83032414C9.

CHANGES

■ REPLACEMENT PARTS LIST

Notes: (1) Mentioned in this parts list are only those changed in Model No. SU-V707/(K) for destination [E] area.
(2) Important safety notice: Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
(3) The " Ⓢ " mark is service standard parts and may differ from production parts.

Ref. No.	Change of Part No.		Part Name & Description	Per Set (Pcs.)	Remarks
	SU-V707/(K) [E]	SU-V707/(K) [EGA]			
COILS					
L1, 2	Addition	ELQ050D15	Choke	2	
L351~354	Addition	SLQY07G-30	Choke	4	
TRANSFORMER					
T1	SLT5P229	SLT5P231	Power Source	1	⚠
COMPONENT COMBINATION					
Z151, 152	Addition	SLM1Z33	L.P.F.	2	
LAMPS					
PL1~3	XAMR74S10	XAMR74S17	New Class A, 12V, 0.055A	3	
FUSES					
F1	XBA2C50TRO	XBA2C25TRO	250V, T2.5A	1	⚠
F2	XBA2C25TRO	Abolition	----------	0	
SWITCH					
S11	ESE37219	Abolition	----------	0	
RESISTORS					
R251~258	Addition	ERD25FJ272	Carbon, 2.7kΩ, 1/4W	8	Ⓢ
R151~154	Addition	ERD25FJ122	Carbon, 1.2kΩ, 1/4W	4	Ⓢ
CAPACITORS					
C131~134	Addition	ECCD1H101K	Ceramic, 100pF, 50V	4	Ⓢ
C251, 252	Addition	ECCD1H121K	Ceramic, 120pF, 50V	2	Ⓢ
C351~354	Addition	ECKD1H471KB	Ceramic, 470pF, 50V	4	Ⓢ
C355~358	Addition	ECKD1H102MD	Ceramic, 0.001μF, 50V	4	Ⓢ
C359	Addition	ECKD1H333ZF	Ceramic, 0.033μF, 50V	1	Ⓢ
CABINET and CHASSIS PARTS					
26	SJA97	SJA138-3	AC Cord	1	Ⓢ ⚠
27	SGPUV707B	SGPUV707G	Rear Panel	1	
ACCESSORY					
A4	SQF11703	SQF11705	Instruction Book	1	

Technics

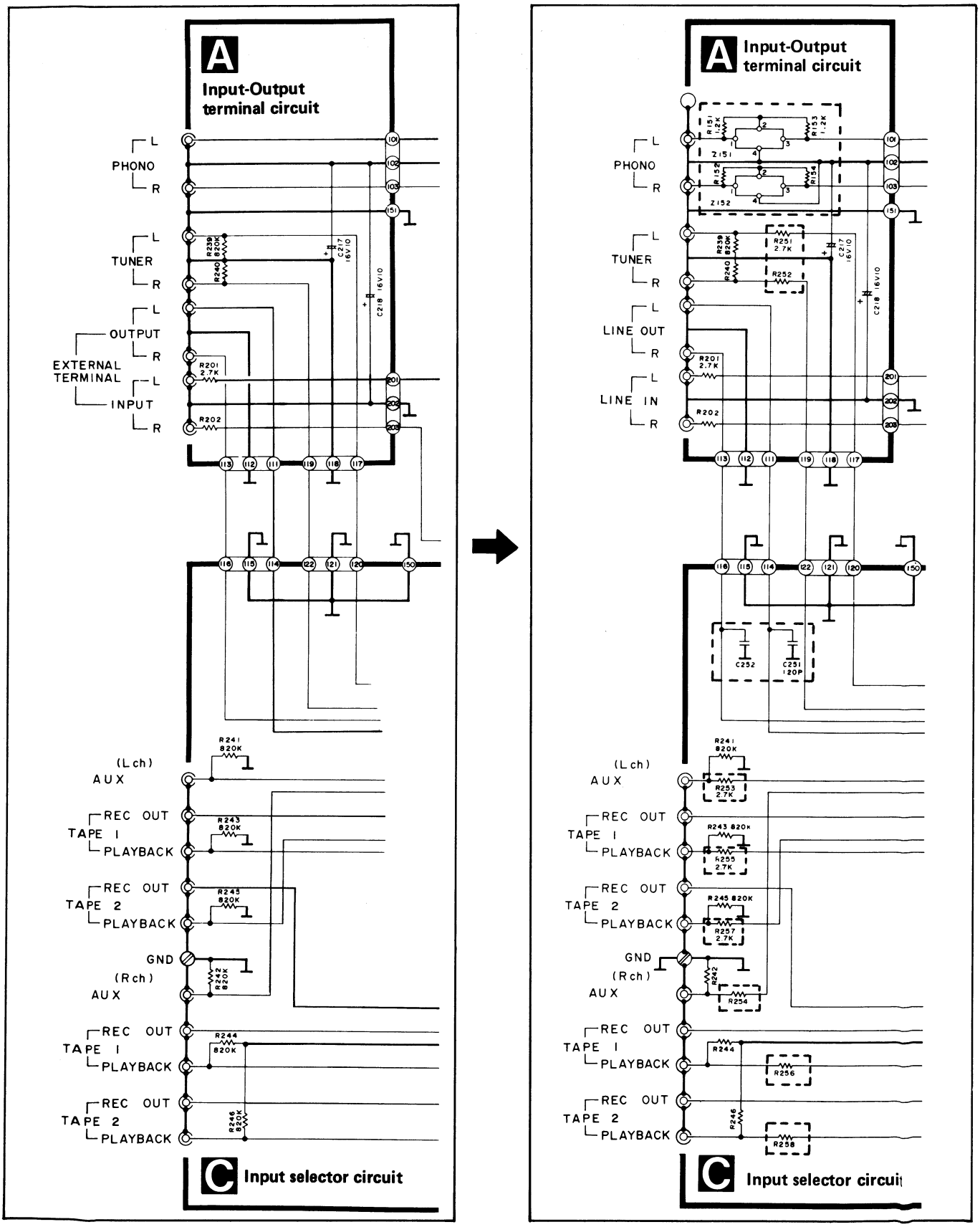
Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

■ SCHEMATIC DIAGRAM

SU-V707/(K)-[E] change → SU-V707/(K)-[EGA]

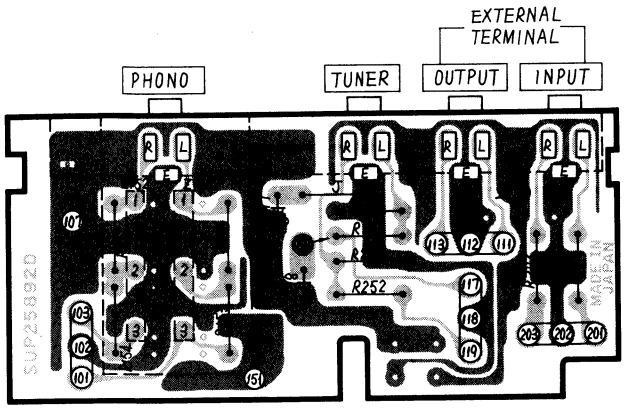
• Input-Output terminal circuit

Addition parts

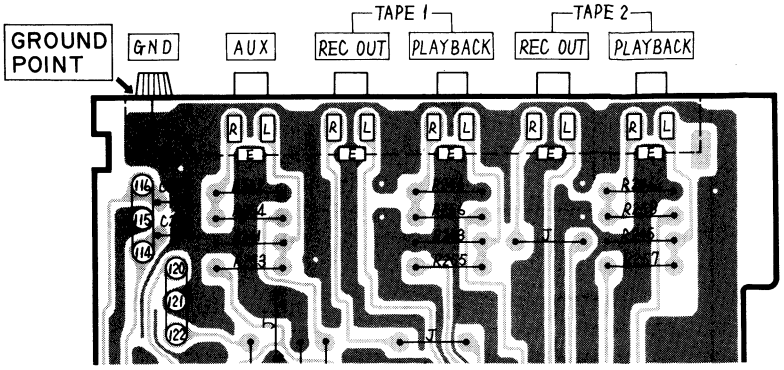


■ ADDITIONAL PARTS OF PRINTED CIRCUIT BOARD

A Input-Output circuit



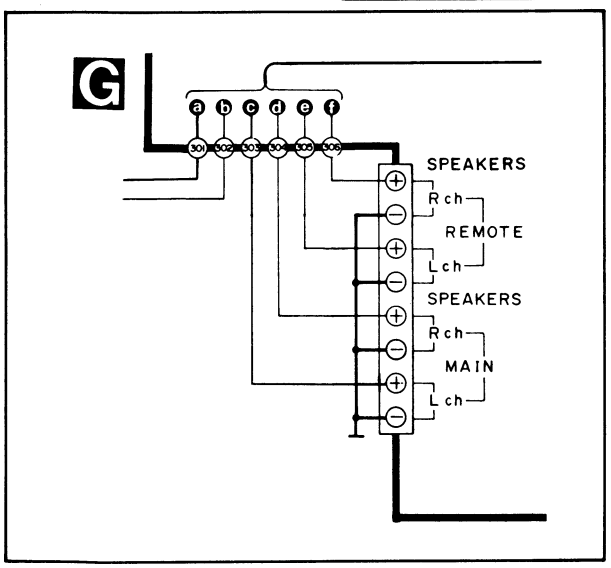
C Input selector circuit



• Speaker terminal

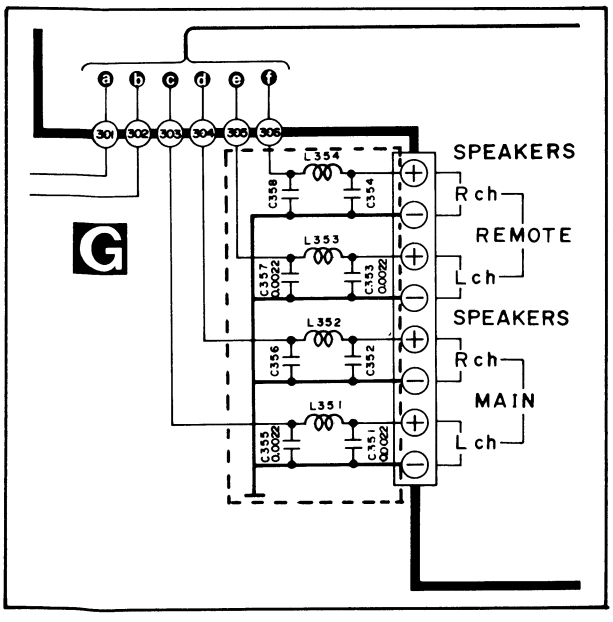
SU-V707/(K)-[E]

Addition parts



change

SU-V707/(K)-[EGA]



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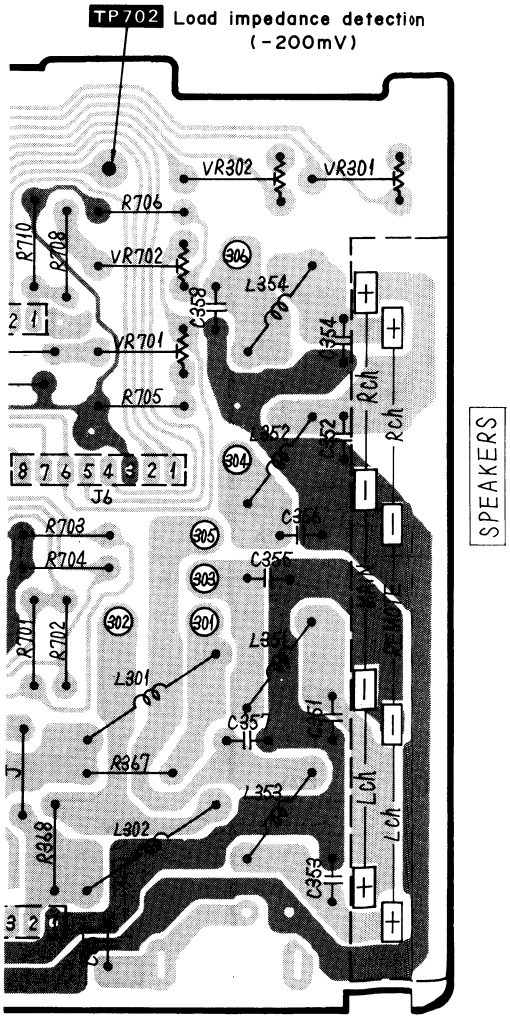
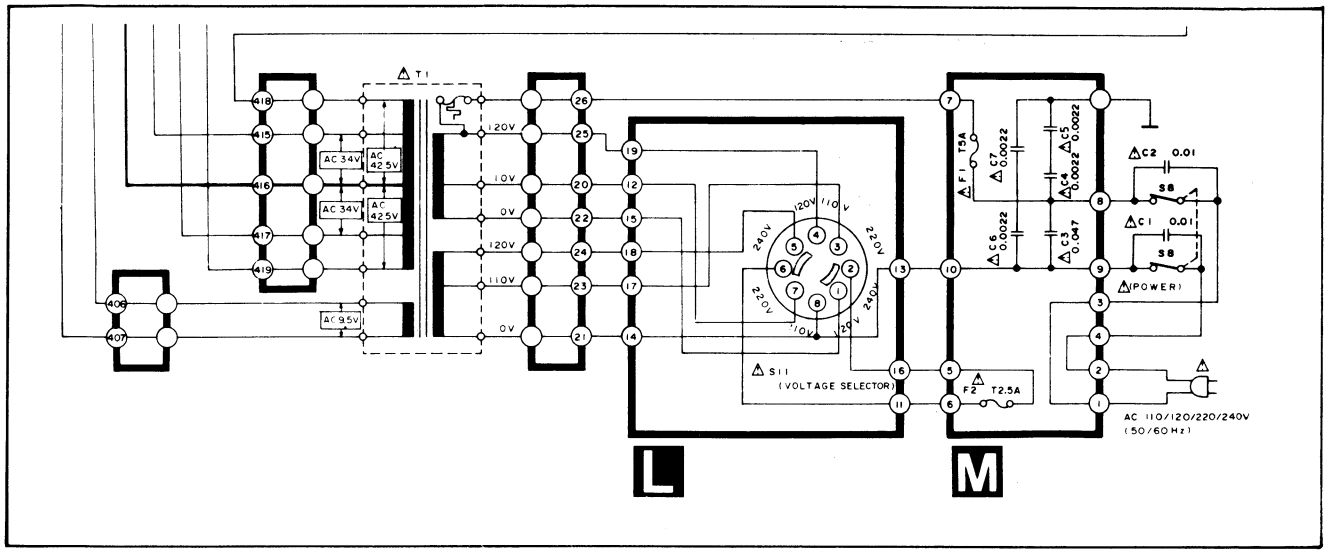


■ SCHEMATIC DIAGRAM

• Power source circuit

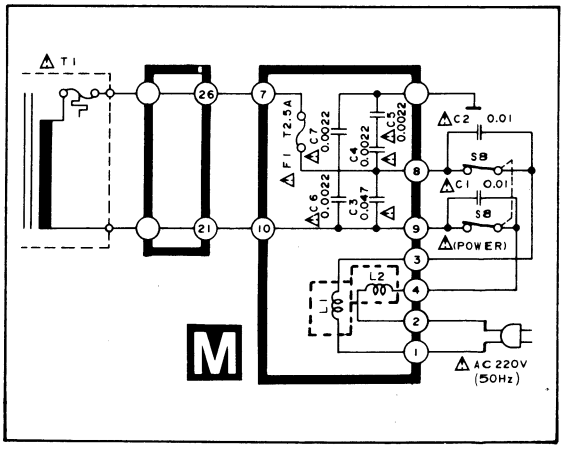
[- - -] Addition parts

SU-V707/(K)-[E]

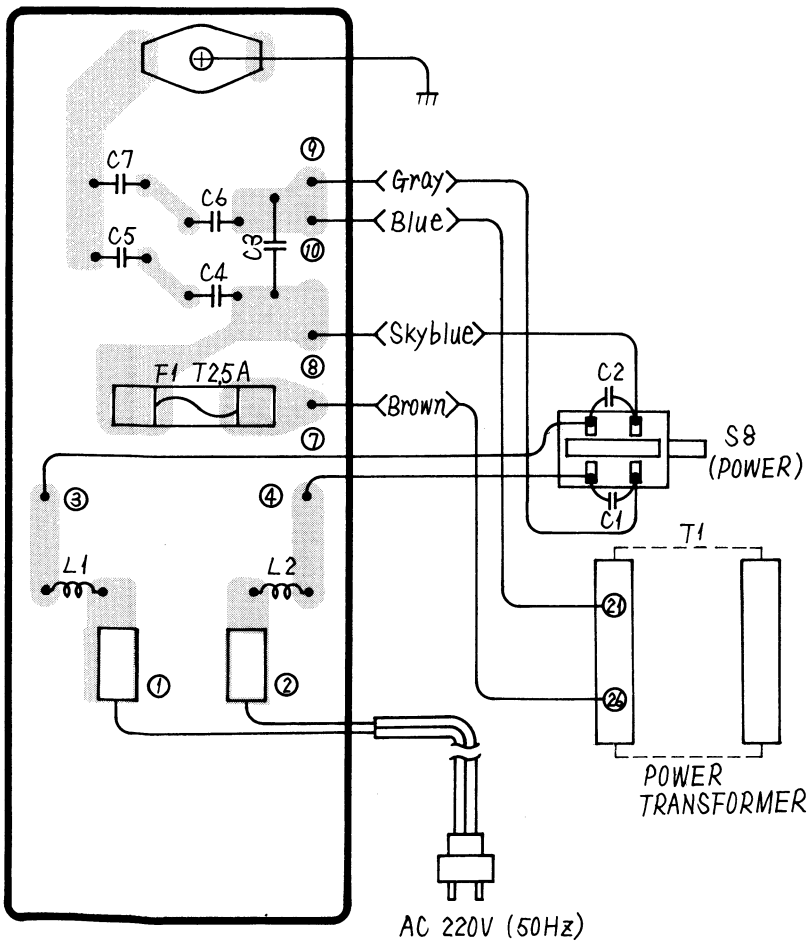


change

SU-V707/(K)-[EGA]



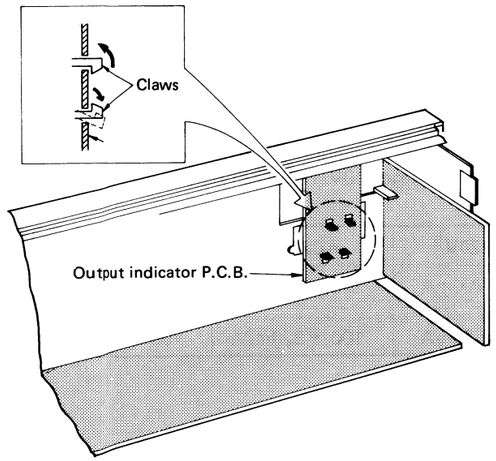
■ ADDITION PARTS OF PRINTED CIRCUIT BOARD



Printed in Japan
8309O1350 Ⓚ SH/KS

● How to remove the front panel

1. Remove the cabinet.
2. Loosen the 3 selector knob screws by hexagonal rod wrench (M3), and pull out the knobs.
3. Remove the 5 setscrews (Fig. 1: ⑩ ~ ⑭) of the front panel.
4. Release the 4 claws which fasten the output indicator P.C.B. and remove the P.C.B. (See Fig. 3.)
5. Insert a screwdriver between the front panel and front chassis while lightly pressing the claw and raise the screwdriver upward to remove the front panel. (See Fig. 1)
6. Remove the front panel from the chassis with care not to damage the knobs.



[Fig. 3]

● How to remove the speaker selector/tap selector P.C.B. or muting/tone control/DC servo P.C.B.

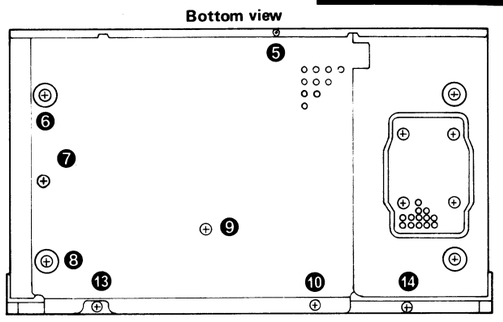
[Speaker selector and tap selector P.C.B.]

1. Remove the cabinet and bottom board.
2. Remove the 1 setscrew (Fig. 4: ⑮) from the P.C.B. and 1 Nut (Fig. 4: ⑯)
3. Move the P.C.B. in the direction of the arrow Ⓑ in Fig. 5

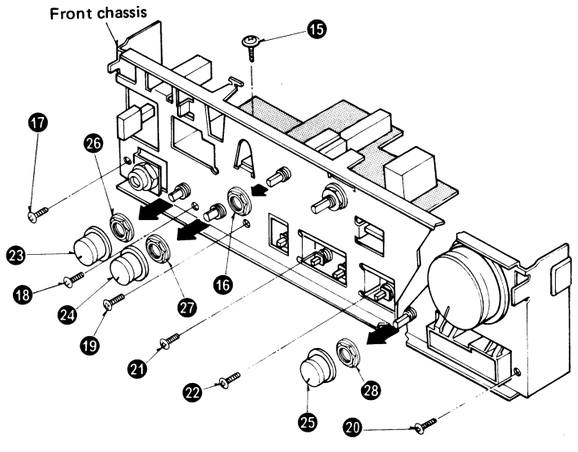
[Muting/tone control/DC servo P.C.B]

1. Remove the cabinet and bottom board.
2. Remove the 4 setscrews (Fig. 4: ⑰ ~ ⑳) of the front chassis.
3. Remove the 2 setscrews (Fig. 4: ㉑, ㉒) of the P.C.B.
4. Remove the 3 knobs (Fig. 4: ㉓ ~ ㉕) and 3 Nuts (Fig. 4: ㉖ ~ ㉘) of the P.C.B.
5. Move the P.C.B. in the direction of the arrow Ⓒ in Fig. 5

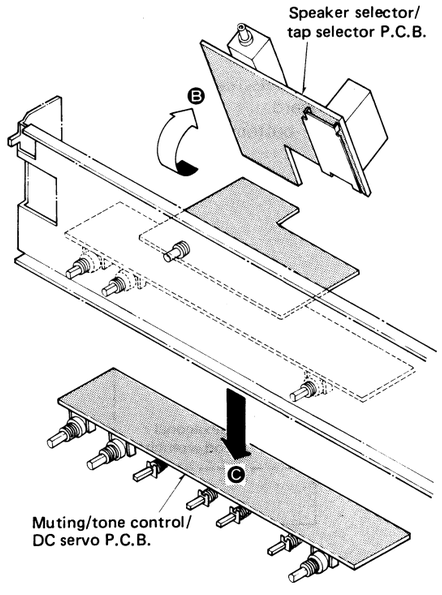
NOTE:
When fitting the selector knob, provide a clearance of about 0.7mm between the front panel and the knob.



[Fig. 2]



[Fig. 4]



[Fig. 5]

● How to remove the power transistors

1. Remove the cabinet and bottom board.
2. Unsolder the power transistors Q325 ~ Q328. (See Fig. 6)
3. Remove the 4 setscrews (Fig. 6: ㉙ , ㉚ and Fig. 7: ㉛ , ㉜) which secure the heat-sink.
4. Remove the power transistor retainer to remove the power transistors. (See Fig. 8)

Cautions:

When mounting the power transistor onto the heat-sink, especially keep the following points in mind.

1-1 Clean the area on the heat-sink side.

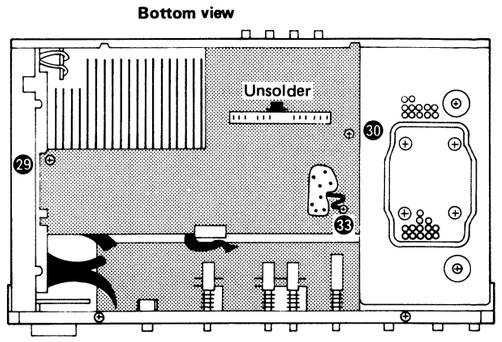
1-2 Be sure to use new insulating paper (SMX767).

1-3 Never apply heat diffuser or the like to the insulating paper (SMX767).
(Otherwise, the insulation will be deteriorated leading to breakdown of power transistor.)

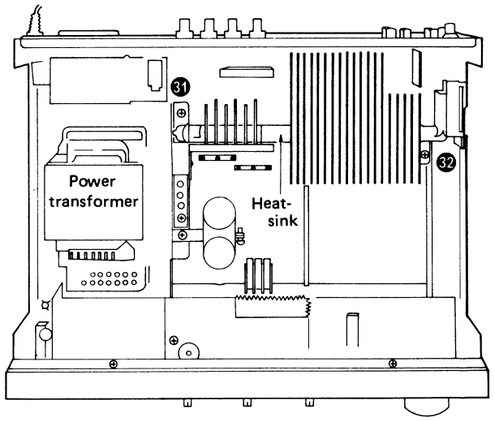
2-1 Do not apply a heat diffuser or the like to the insulation sheet. [Fig. 8]

2-2 Make sure that the ceramistor and temperature compensating transistors are in tight contact with the heat-sink. [Fig. 9]

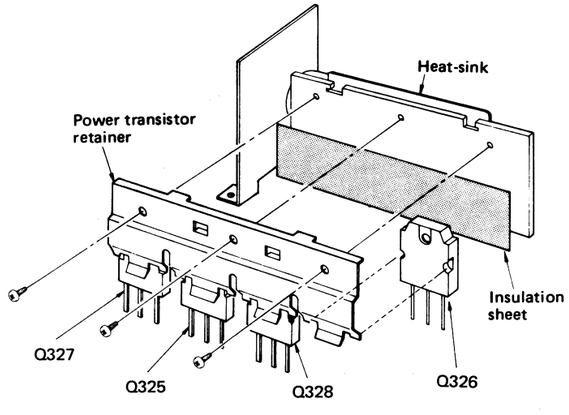
* Ceramistor: Element whose change in temperature and resistance is positive (proportional).



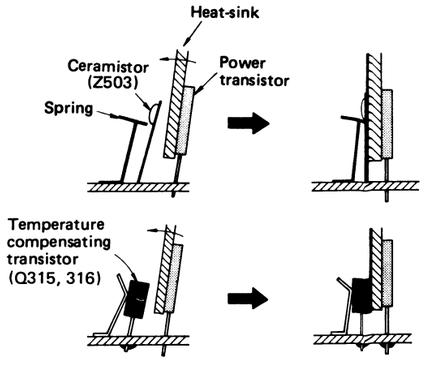
[Fig. 6]



[Fig. 7]

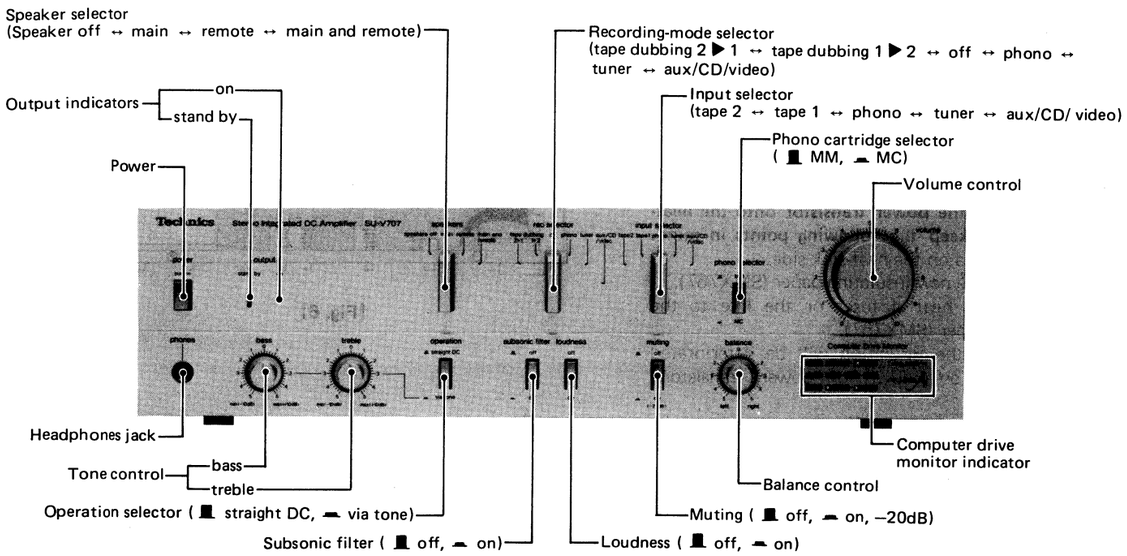


[Fig. 8]



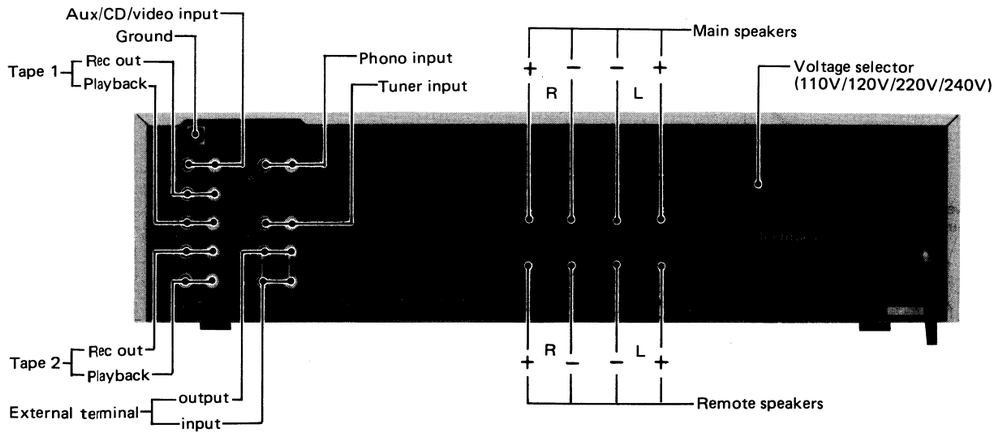
[Fig. 9]

■ LOCATION OF CONTROLS


Speaker selector
(Speaker off ↔ main ↔ remote ↔ main and remote)
Output indicators
on
stand by
Power
Recording-mode selector
(tape dubbing 2 ▶ 1 ↔ tape dubbing 1 ▶ 2 ↔ off ↔ phono ↔ tuner ↔ aux/CD/video)
Input selector
(tape 2 ↔ tape 1 ↔ phono ↔ tuner ↔ aux/CD/ video)
Phono cartridge selector
(MM, MC)
Volume control
Headphones jack
Tone control
bass
treble
Operation selector (straight DC, via tone)
Subsonic filter (off, on)
Loudness (off, on)
Muting (off, on, –20dB)
Balance control
Computer drive monitor indicator

Output indicators (output)

These indicators show the condition of the signal sent to speakers or headphones.
When the power switch is switched on, the "stand by" indicator flashes, and when the unit is operating normally, the "on" indicator will illuminate.
Note that the "stand by" indicator will flash if the positive and negative speaker terminals or speaker connection cords are short-circuited, or if some other circuit abnormality which causes the protection circuit to function is detected. If this occurs, switch the power switch off, and then on again after first determining the cause of the problem and correcting it.



* Phono input capacitance is about 150pF.

■ PROTECTION CIRCUITRY

The protection circuitry may have operated if either of the following conditions is noticed:

- No sound is heard when the power is turned on.
- Sound stops during a performance.

The function of this circuitry is to prevent circuitry damage if, for example, the positive and negative speaker connection wires are "shorted", or if speaker systems with an impedance less than the indicated rated impedance of this unit are used.

If this occurs, follow the procedure outlines below:

1. Turn off the power.
2. Determine the cause of the problem and correct it.
3. Turn on the power once again after one minute.

Note
When the protection circuitry functions, the unit will not operate unless the power is first turned off and then on again.

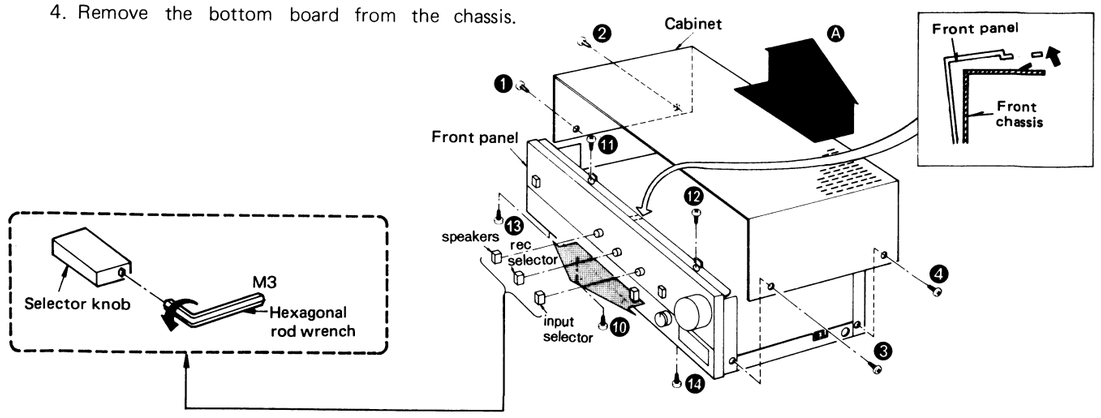
■ BEFORE REPAIR AND ADJUSTMENT

1. Turn off the power supply and short-circuit of power supply capacitors (C403, C404, 15000μF and C405, 2200μF) at resistance (about 10Ω, 5W) in order to discharge the charged voltage. Do not short between C403, C404 and C405 by screwdriver. It may damage the componet.
2. Before turning on the power supply after completion of repair, slowly apply the primary voltage by using a power supply voltage controller to make sure that the consumed current is free of abnormality. The consumed current at 60Hz/50Hz in no signal mode is shown below with respect to supply voltage 110V/120V/220V/240.

Power supply voltage		AC110V	AC120V	AC220V	AC240V
Cousumed current	50 Hz	210 ~ 630mA	230 ~ 700mA	120 ~ 380mA	110 ~ 330mA
	60 Hz	180 ~ 570mA	170 ~ 550mA	100 ~ 320mA	90 ~ 300mA

■ DISASSEMBLY INSTRUCTIONS

- **How to remove the cabinet and the bottom board**
  1. Remove the 4 setscrews (Fig. 1: ❶ ~ ❹) of the cabinet.
  2. Move the cabinet in the direction of the arrow Ⓐ in Fig. 1
  3. Remove the 6 setscrews (Fig. 2: ❺ ~ ❿) of the bottom board.
  4. Remove the bottom board from the chassis.



[Fig. 1]

- **Vérification d'une détection de surcharge et du circuit de protection**
  (1) Appliquer un signal de sortie d'à peu près 1,5V à 1 kHz à la borne d'entrée AUX.
  (2) Avec les bornes du haut-parleur principal (canal de gauche) court-circuitées par un fil d'amenée (aussi épais et court que possible):
  S'assurer que
  - le relais est hors circuit.
  - l'indicateur de sortie "on" (marche) s'éteigne.
  - l'indicateur de sortie "stand by" (attente) clignote.

  (3) S'assurer que la condition de (2) soit obtenue avec le circuit de sortie ouvert. De même, vérifier aussi le canal de droite.
  * Lorsque le relais est hors circuit, tourner l'énergie de l'appareil sur "off" pendant un certain temps avant de remettre en marche ("on").
  Sans quoi, les conditions originales ne seront pas rétablies même lorsque le circuit et la charge sont normaux.

ESPAÑOL

■ ESPECIFICACIONES (Estas especificaciones están sujetas a cualquier cambio sin previo eviso.)

(DIN 45 500)

■ SECCION AMPLIFICADOR

Potencia continua de 20 Hz~20 kHz en ambos canales	2 × 80W (4Ω) 2 × 90W (8Ω)
Potencia continua de 40 Hz~16 kHz en ambos canales	2 × 80W (4Ω) 2 × 90W (8Ω)
Potencia continua de 1 kHz en ambos canales	2 × 80W (4Ω) 2 × 90W (8Ω)
Distorsión armónica total	
potencia de régimen a 20 Hz~20 kHz	0,007% (4Ω) 0,003% (8Ω)
potencia de régimen a 40 Hz~16 kHz	0,007% (4Ω) 0,003% (8Ω)
potencia de régimen a 1 kHz	0,0015% (4Ω) 0,001% (8Ω)
mitad de potencia a 20 Hz~20 kHz	0,002% (8Ω)
mitad de potencia a 1 kHz	0,001% (8Ω)
−26 dB de potencia a 1 kHz	0,01% (4Ω)
50 mW de potencia a 1 kHz	0,01% (4Ω)
Distorsión por intermodulación	
potencia de régimen a 250 Hz: 8 kHz=4:1, 4Ω	0,01%
potencia de régimen a 60 Hz: 7 kHz=4:1, SMPTE, 8Ω	0,007%
Ancho de banda de potencia con ambos canales, −3 dB	5 Hz~70 kHz (4Ω, 0,03%) 5 Hz~70 kHz (8Ω, 0,02%)
Zumbido residual y ruido	0,5 mV
Factor de amortiguamiento	30 (4Ω), 60 (8Ω)
Sensibilidad e impedancia de entrada	
TOCADISC. I. M. (PHONO MM)	2,5 mV/47kΩ
TOCADISC. B. M. (PHONO MC)	170 μV/220Ω
SINTON. (TUNER)	150 mV/18kΩ
AUX./CD/VIDEO (AUX/CD/VIDEO)	150 mV/18kΩ
GRAB. 1 (TAPE 1)	150 mV/18kΩ
GRAB. 2 (TAPE 2)	150 mV/18kΩ
Voltaje máximo de entrada de PHONO (1 kHz, RMS)	
I. M. (MM)	210 mV
B. M. (MC)	15 mV
Relación de señal a ruido	
potencia de régimen (4Ω)	
TOCADISC. I. M. (PHONO MM)	78 dB (88 dB, IHF, A, entrada de 2,5 mV)
TOCADISC. B. M. (PHONO MC)	72 dB (72 dB, IHF, A, entrada de 250 μV)
SINTON. (TUNER)	93 dB (IHF, A: 104 dB)
AUX./CD/VIDEO, GRAB. (AUX/CD/VIDEO, TAPE)	93 dB (IHF, A: 104 dB)
−26 dB de potencia (4Ω)	
TOCADISC. I. M. (PHONO MM)	72 dB
TOCADISC. B. M. (PHONO MC)	68 dB
SINTON. (TUNER)	74 dB
AUX./CD/VIDEO, GRAB. (AUX/CD/VIDEO, TAPE)	74 dB
50 mW de potencia (4Ω)	
TOCADISC. I. M. (PHONO MM)	68 dB
TOCADISC. B. M. (PHONO MC)	67 dB
SINTON. (TUNER)	69 dB
AUX./CD/VIDEO, GRAB. (AUX/CD/VIDEO, TAPE)	69 dB
Respuesta de frecuencia	
TOCADISC. (PHONO)	curva RIAA estándar ±0,5 dB (30 Hz~15 kHz)
SINTON. (TUNER)	0,7 Hz~140 kHz (−3 dB) +0 dB −0.2 dB (20 Hz~20 kHz)
AUX./CD/VIDEO, GRAB. (AUX/CD/VIDEO, TAPE)	0,7 Hz~140 kHz (−3 dB) +0 dB, −0,2 dB (20 Hz~20 kHz)
Controles de tono	
BAJOS (BASS)	50 Hz, +10 dB~ −10 dB
AGUDOS (TREBLE)	20 kHz, +10 dB~ −10 dB
Filtro subsónico	30 Hz, −6 dB/oct.
Control de sonoridad (volumen a −30 dB)	50 Hz, +9 dB
Silenciamiento	−20 dB
Voltaje de salida	
SAL. GRAB. (REC OUT)	150 mV
Equilibrio de canales, AUX/CD/VIDEO 250 Hz~6 300 Hz	±1 dB
Separación de canales, AUX/CD/VIDEO, 1 kHz	55 dB
Impedancia y nivel de salida de los auriculares	630 mV/330Ω
Impedancia de carga	
MAIN o REMOTE	4Ω~16Ω
MAIN y REMOTE	8Ω~16Ω

■ GENERAL

Consumo de energía	510W
Alimentación de energía	
Para Germany	CA 50 Hz/60 Hz, 220V
Para otros paises	CA 50 Hz/60 Hz, 110V/120V/220V/240V
Dimensiones (An.×Al.×Prof.)	430 × 120 × 362 mm
Peso	10 kg

Nota:
La distorsión armónica total se mide con el analizador de espectro digital (sistema H.P. 3045).

■ MEDICIONES Y AJUSTE

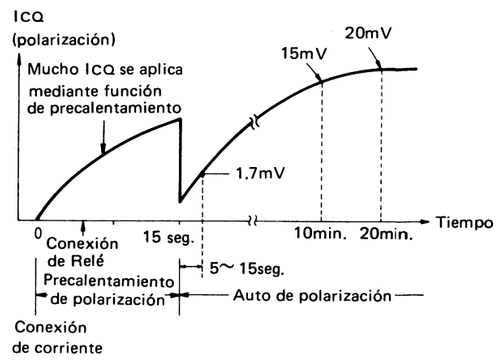
1. Ajuste de Reloj (después de reemplazar el microcomputador)

(1) Desconecte la fuente de alimentación.
(2) Ajuste VR501 de manera que el tiempo, hasta que el relé se conecte, sea 5~7-seg. después de conectarse la corriente.
  * El tiempo se prolonga con VR501 girado a la izquierda (en la dirección de A). (La frecuencia disminuye.)
  * El tiempo se acorta con VR501 girado a la derecha (en la dirección de B). (La frecuencia aumenta.)

(Nota) La frecuencia de reloj de 400 kHz se obtiene en TP501. En el caso de un contador de frecuencia y osciloscopio ordinarios, la frecuencia no se puede medir correctamente debido a la capacidad de prueba. Por lo tanto, se recomienda emplear el método antes mencionado durante la prestación de servicio.

2. Ajuste de Marcha en Vacìo (ICQ) (después de reparar el amp. principal)

(1) Después de la reparación, ajuste el volumen de sonido al mínimo antes de conectar el interruptor de alimentación, y no conecte nada a los terminales de altavoz.
(2) Gire completamente el control ICQ (VR301, 302) a la izquierda.
(3) Aumente el voltaje aplicado al amplificador gradualmente desde 0V mediante un regulador de voltaje, y asegúrese del valor en la tabla de abajo antes de comenzar el ajuste.
(4) Conecte el voltímetro electrónico de CC a TP302 (+) y TP301 (−) (canal izquierdo) o TP304 (+) y TP303 (−) (canal derecho).
(5) Cuando 5 ó15 segundos han pasado después que el "auto" de monitor de impulsión de computador se enciende, ajuste VR301 (canal izquierdo) o VR302 (canal derecho) a 2mV.
  * En este aparato, ICQ es regulado mediante computador, y ICQ un poco más del nivel normal se aplica mediante "PRECALENTAMIENTO" por unos 15 seg. después de conectarse la corriente. Después de eso, el nivel de salida y la temperatura de transistor se detectan mediatne "AUTO", regulando así automáticamente ICQ.



3. Ajuste de Circuito de Detección de Impedancia de Carga (después de reparar el circuito de detección de impedancia de altavoz)

(1) Conecte una carga con 6,5Ω (resistencia de carbón de 1/2W) o 3,3Ω conectados en serie y 3,3Ω (1/2W, ±5%) a los terminales de altavoz "principal".
(2) Ponga el selector de altavoz en la posición "principal".
(3) Conecte TP601 y chasis.
(4) Conecte un voltímetro de CC entre TP701 y chasis (canal I.) o TP702 y chasis (canal D.)
(5) Ajuste VR701 (canal I.) de manera que el voltaje de TP701 sea −200mV.
(6) Ajuste VR702 (canal D.) de manera que el voltaje de TP702 sea −200mV.

NOTA
Asegúrese de ajustar VR702 (canal D.) después de ajustar VR701 (canal I.)

* Chequeos de Circuito de Protección Después de Reparación y Ajuste

- **Chequeo de Silenciamiento con Conexión/Desconexión de Corriente.**
  (1) Conecte voltímetro de CA y carga de 8Ω (resistor o altavoz) a terminales de altavoz principal.
  (2) Ajuste el volumen de sonido a un nivel apropiado.
  (3) Aplique señal de 1 kHz 100 mV a terminal de entrada AUX.
  (4) Asegúrese de que salida ha ganado 4 ~ 6 seg. después de la conexión de interruptor de alimentación, y que la salida desaparece inmediatamente después de la desconexión del interruptor de alimentación.

- **Chequeo de Detección de Sobrecarga y Circuito de Protección**
  (1) Aplique señal de salida de aprox. 1,5V a 1kHz a terminal de entrada AUX.
  (2) Con terminales de altavoz principal (canal izquierdo) cortocircuitados mediante alambre de plomo (lo más grueso y corto posible):
  Asegúrese de que
  - relé está desconectado.
  - indicador de salida "encendido" se apaga.
  - indicador de salida "de reserva" parpadea.

  (3) Asegúrse de que el estado de (2) ha ganado con circuito de salida abierto. Similarmente, chequee el canal derecho también.
  * Cuando el relé está desconectado, desconecte la corriente y unidad por un tiempo antes de conectarla. De lo contrario, las condiciones originales no se restauran aun cuando el circuito y la carga sean normales.

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- **Überprüfung der Überlastungs—Detektions— und —Schutzschaltung**
  (1) Ausgangssignal von 1,5V bei 1kHz an den AUX—Eingangsanschluß anlegen.
  (2) Die Hauptlautsprecheranschlüsse (linder Kanal) mit (möglichst kurzem und dickem) Draht kurzschließen; dann überprüfen, daß:
  - das Relais ausgeschaltet ist.
  - die Ausgangsanzeige "on" erlöscht.
  - die Ausgangsanzeige "stand by" blinkt.

  (3) Sicherstellen, daß der Zustand (2) bei geöffneter Ausgangsschaltung erreicht wird. Auf entsprechende Weise ist auch der rechte Kanal zu prüfen.
  * Wenn das Relais ausgeschaltet ist, die Stromzufuhr ausschalten und einige Zeit ausgeschaltet lassen, bevor sie wieder eingeschaltet wird.
  Andernfalls werden die ursprünglichen Zustände nicht wiederhergestellt, auch dann nicht, wenn die Schaltung und die Last normal sind.

FRANÇAIS

■ CARACTERISTIQUES (Sujet à changement sans prearis.)

(DIN 45 500)

■ SECTION AMPLIFICATEUR

Puissance de sortie continue de 20 Hz~20 kHz, les deux canaux en circuit	2 × 80W (4Ω) 2 × 90W (8Ω)
Puissance de sortie continue de 40 Hz~16 kHz, les deux canaux en circuit	2 × 80W (4Ω) 2 × 90W (8Ω)
Puissance de sortie continue à 1 kHz les deux canaux en circuit	2 × 80W (4Ω) 2 × 90W (8Ω)
Distorsion harmonique totale	
à puissance nominale (20 Hz~20 kHz)	0,007% (4Ω) 0,003% (8Ω)
à puissance nominale (40 Hz~16 kHz)	0,007% (4Ω) 0,003% (8Ω)
à puissance nominale (1 kHz)	0,0015% (4Ω) 0,001% (8Ω)
à demi-puissance (20 Hz~20 kHz)	0,002% (8Ω)
à demi-puissance (1 kHz)	0,001% (8Ω)
puissance de −26 dB à 1 kHz	0,01% (4Ω)
puissance de 50 mW à 1 kHz	0,01% (4Ω)
Distorsion d'intermodulation	
à puissance nominale à 250 Hz: 8 kHz=4:1, 4Ω	0,01%
à puissance nominale à 60 Hz: 7 kHz=4:1, SMPTE, 8Ω	0,007%
Réponse de fréquences	
les deux canaux en circuit, −3 dB	5 Hz~70 kHz (4Ω, 0,03%) 5 Hz~70 kHz (8Ω, 0,02%)
Bruit et ronflement résiduels	0,5 mV
Coefficient d'amortissement	30 (4Ω), 60 (8Ω)
Sensibilité et impédance d'entrée	
PHONO, AIMANT MOBILE (PHONO MM)	2,5 mV/47kΩ
PHONO, BOBINE MOBILE (PHONO MC)	170 μV/220Ω
SYNTONISATEUR (TUNER)	150 mV/18kΩ
AUX/CD/VIDEO	150 mV/18kΩ
BANDE 1 (TAPE 1)	150 mV/18kΩ
BANDE 2 (TAPE 2)	150 mV/18kΩ
Réponse de fréquence	
PHONO	Courbe nominale RIAA ±0,5 dB (30 Hz~15 kHz)
SYNTONISATEUR (TUNER)	0,7 Hz~140 kHz (−3 dB) +0 dB, −0,2 dB (20 Hz~20 kHz)
AUX/CD/VIDEO, BANDE (AUX/CD/VIDEO, TAPE)	0,7 Hz~140 kHz (−3 dB) +0 dB, −0,2 dB (20 Hz~20 kHz)
PHONO (tension d'entrée maximum, 1 kHz RMS)	
AIMANT MOBILE (MM)	210 mV
BOBINE MOBILE (MC)	15 mV
Signal/Bruit	
à puissance nominale (4Ω)	
PHONO, AIMANT MOBILE (PHONO MM)	78 dB (88 dB, IHF, A, 2,5 mV entrée)
PHONO, BOBINE MOBILE (PHONO MC)	72 dB (72 dB, IHF, A, 250 μV entrée)
SYNTONISATEUR (TUNER)	93 dB (IHF, A: 104 dB)
AUX/CD/VIDEO, BANDE (AUX/CD/VIDEO, TAPE)	93 dB (IHF, A: 104 dB)
puissance de −26 dB (4Ω)	
PHONO, AIMANT MOBILE (PHONO MM)	72 dB
PHONO, BOBINE MOBILE (PHONO MC)	68 dB
SYNTONISATEUR (TUNER)	74 dB
AUX/CD/VIDEO, BANDE (AUX/CD/VIDEO, TAPE)	74 dB
puissance de 50 mW (4Ω)	
PHONO, AIMANT MOBILE (PHONO MM)	68 dB
PHONO, BOBINE MOBILE (PHONO MC)	67 dB
SYNTONISATEUR (TUNER)	69 dB
AUX/CD/VIDEO, BANDE (AUX/CD/VIDEO, TAPE)	69 dB
Réglage de la tonalité	
BASSES (BASS)	50 Hz, +10 dB~ −10 dB
AIGUS (TREBLE)	20 kHz, +10 dB~ −10 dB
Filtre subsonique	30 Hz, −6 dB/oct.
Compensateur physiologique (volume à −30 dB)	50 Hz, +9 dB
Réglage silencieux	−20 dB
Tension de sortie	
SORTIE ENREGISTREMENT (REC OUT)	150 mV
Equilibrage des canaux, AUX/CD/VIDEO 250 Hz~6 300 Hz	±1 dB
Séparation des canaux, AUX/CD/VIDEO, 1 kHz	55 dB
Niveau de sortie des casques et impédance	630 mV/330Ω
Impédance de charge	
PRINCIPALE ou AUXILIAIRE (MAIN or REMOTE)	4Ω~16Ω
PRINCIPALE et AUXILIAIRE (MAIN and REMOTE)	8Ω~16Ω

■ DIVERS

Consommation	510W
Alimentation	
Pour Germany	CA 50 Hz/60 Hz, 220V
Autres	CA 50 Hz/60 Hz, 110V/120V/220V/240V
Dimensions (L×H×Pr)	430 × 120 × 362 mm
Poids	10 kg

Remarques:
1. On mesure la distorsion harmonique totale au moyen d'un analyseur de spectre digital (Système H.P. 3045).
2. La Société NATIONAL-PANASONIC-FRANCE, importateur du matériel MATSUSHITA-ELECTRIC déclare que cet appareil est conforme aux prescriptions de la directive 76/889/C.E.E. (arrêté 14 Janvier 1980).

■ MESURAGES ET RÉGLAGES

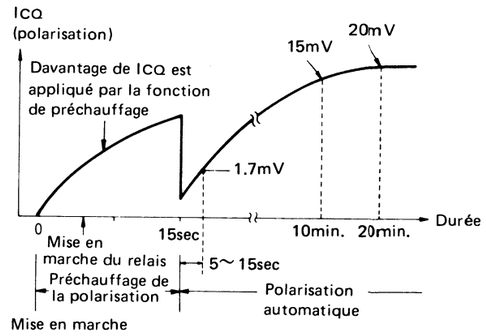
1. Ajustement des impulsions de rythme (après la remise en place du micro-ordinateur)

(1) Mettre hors circuit l'alimentation.
(2) Ajuster VR501 de telle sorte que la durée jusqu'à ce que le relais se mette en circuit soit de 5~7-sec. après la mise en marche.
* La durée s'allonge avec VR501 tourné dans le sens inverse des aiguilles d'une montre (dans la direction de A). (La fréquence diminue.)
* La durée raccourcit avec VR501 tourné dans le sens des aiguilles d'une montre (dans la direction de B). (La fréquence augmente.)

(Nota) Une fréquence d'impulsions de rythme de 400 kHz est obtenue à TP501. Dans le cas d'un oscilloscope et d'un compteur à fréquence normale, la fréquence ne peut être mesurée correctement à cause de la capacité de la sonde. Aussi, il est conseillé d'utiliser la méthode mentionnée cidessus pendant le dépannage.

2. Ajustement de la marche à vide (ICQ) (après réparation de l'amplificateur principal)

(1) Après la réparation, régler le volume sonore au minimum avant la mise en circuit de l'interrupteur d'alimentation, et ne rien raccorder aux bornes des haut-parleurs.
(2) Tourner entièrement dans le sens inverse des aiguilles d'une montre la commande ICQ (VR301 et 302).
(3) Augmenter graduellement la tension appliquée à l'amplificateur à partir de OV au moyen du régulateur de tension, et vérifier la valeur d'après le tableau ci-dessous avant de commencer l'ajustement.
(4) Brancher un voltmètre électronique à C.C. à TP302 (+) et à TP301 (−) (canal de gauche) ou à TP304 (+) et TP303 (−) (canal de droite).
(5) Lorsque 5 ou 15 secondes se sont écoulées après que le contrôleur d'entraînement "auto" de l'ordinateur se soit éclairé, ajuster VR301 (canal de gauche) ou VR302 (canal de droite) sur 2 mV.
* Dans cet appareil, ICQ est contrôlé par le micro-ordinateur et ICQ, un peu plus que le niveau normal, est appliqué par le "PRECHAUFFAGE" ("Preheat") pendant à peu près 15 secondes après la mise en marche. Après cela, le niveau de sortie et la température du transistor sont détectés par "AUTO", contrôlant automatiquement ainsi ICQ.



3. Ajustement du circuit de détection d'impédance de charge (après réparation du circuit de détection d'impédance des haut-parleurs)

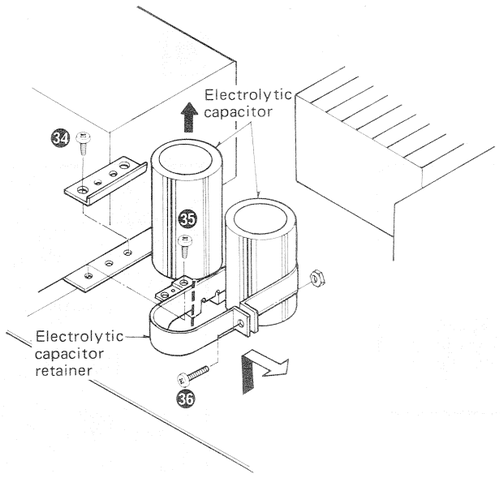
(1) Raccorder une charge de 6,5Ω (1/2W, résistance à couche de carbone) ou 3,3Ω monté en série et 3,3Ω(1/2W, ±5%) aux bornes du haut-parleur principal ("main").
(2) Régler le sélecteur des haut-parleurs sur la position "main" (principale).
(3) Connecter TP601 et el châssis.
(4) Brancher un voltmètre à C.C. entre TP701 et le châssis (canal de gauche) ou TP702 et le châssis (canal de droite).
(5) Ajuster VR701 (canal de gauche) de telle sorte que la tension de TP701 soit de −200mV.
(6) Ajuster VR702 (canal de droite) de telle sorte que la tension de TP702 soit de −200mV.

NOTA
S'assurer d'ajuster VR702 (canal de droite) après l'ajustement de VR701 (canal de gauche).

* Vérifications du circuit de protection après la réparation et l'ajustement

- **Vérification de l'accord silencieux avec l'énergie sur Marche/Arrêt.**
  (1) Brancher un voltmètre à C.A. et une charge de 8Ω (résistance ou haut-parleur) aux bornes du haut-parleur principal.
  (2) Régler le volume sonore sur un niveau approprié.
  (3) Appliquer un signal de 1 kHz 100 mV à la borne d'entrée AUX.
  (4) S'assurer que la puissance de sortie est augmentée 4 ~ 6 —sec. après la mise en circuit ("on") de l'interrupteur d'alimentation, et que la sortie s'achève immédiatement après avoir mis l'interrupteur d'alimentation hors circuti ("off").

- **How to remove the electrolytic capacitor (C403 and C404)**
  1. Remove the cabinet and Bottom board.
  2. Remove the 3 setscrews (Fig. 6: ㉝ and Fig. 10: ㉞ , ㉟) which secure the electrolytic capacitor.
  3. Unsolder the electrolytic capacitor C403 and C404.
  4. Remove the 1 setscrew (Fig. 10: ㊱) of the retainer.



[Fig. 10]

■ MEASUREMENTS AND ADJUSTMENTS

1. Clock Adjustment (after replacing the microcomputer)

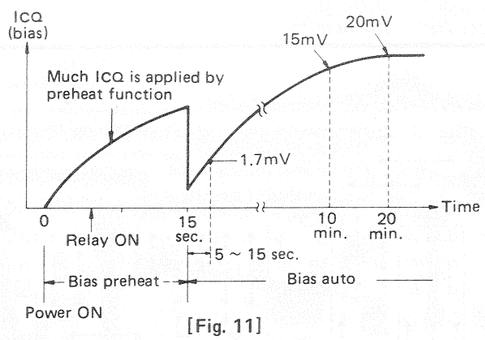
(1) Turn off the power supply.
(2) Adjust VR501 so that the time until the relay turns ON is 5 ~ 7 sec. after power ON.
  * The time elongates with VR501 turned counterclockwise (in the direction of A). (Frequency decreases.)
  * The time shortens with VR501 turned clockwise (in the direction of B). (Frequency increases.)

(Note) Clock frequency of 400 kHz is obtained at TP501. In the case of an ordinary frequency counter and oscilloscope, the frequency cannot be correctly measured because of the probe capacity. So, it is recommended to employ the above-mentioned method during servicing.

2. Idling (ICQ) Adjustment (after reparing the main amp.)

(1) After the repair, set the sound volume to minimum before turning on the power switch, and connect nothing to the speaker terminals.
(2) Completely turn ICQ control (VR301, 302) counter-clockwise.
(3) Increase the voltage applied to the amplifier gradually from 0V by means of a power supply voltage controller, and make sure of the value in the Figure on page 4 before starting the adjustment.
(4) Connect the DC electronic voltmeter to TP302 (+) and TP301 (–) [left channel] or TP304 (+) and TP303 (–) [right channel].
(5) When 5 or 15 seconds have lapsed after computer drive monitor "auto" lights up, adjust VR301 [left channel] or VR302 [right channel] to 2mV.

* In this set, ICQ is controlled by microcomputer, and ICQ a little more than the normal level is applied by "PRE-HEAT" for about 15 sec. after power ON. After that, the output level and transistor temperature are detected by "AUTO", thereby automatically controlling ICQ.



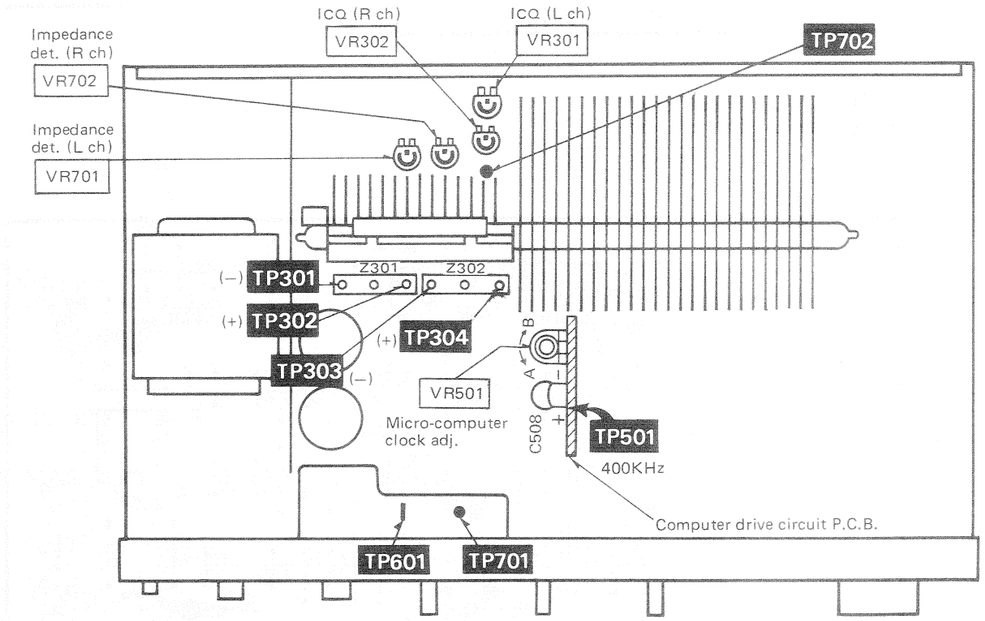
[Fig. 11]

3. Adjustment of Load Impedance Detection Circuit (after reparing the speaker impedance detection circuit).

(1) Connect a load with 6.5Ω (1/2W, carbon, resistor) or series connected 3.3Ω and 3.3Ω (1/2W, ±5%) to the "main" speaker terminals.
(2) Set the speaker selector to the "main" position.
(3) Connect TP601 and chassis.
(4) Connect a DC voltmeter between TP701 and chassis (Lch.) or TP702 and chassis (Rch.)
(5) Adjust VR701 (Lch.) so that the voltage of TP701 is –200mV.
(6) Adjust VR702 (Rch.) so that the voltage of TP702 is –200mV.

NOTE:
Be sure to adjust VR702 (Rch.) after adjusting VR701 (Lch.).

- **Adjustment points**



* Checks of Protection Circuit After Repair and Adjustment

- **Check of Muting with Power On/Off.**
  (1) Connect AC voltmeter and 8Ω load (resistor or speaker) to main speaker terminals.
  (2) Set the sound volume to a proper level.
  (3) Apply 1 kHz 100 mV signal to AUX. input terminal.
  (4) Make sure that output is gained 4 ~ 6 sec. after power switch "on", and that the output goes out immediately after power switch "off".

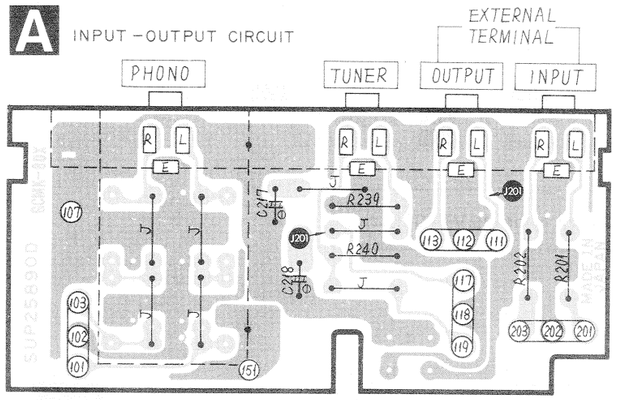
- **Check of Overload Detection and Protection Circuit**
  (1) Apply output signal of about 1.5V at 1kHz to AUX. input terminal.
  (2) With main speaker terminals (left channel) short-circuited by lead wire (as thick and short as possible):
  Make sure
  – relay is off.
  – output indicator "on" goes out.
  – output indicator "stand by" blinks.
  (3) Make sure the state of (2) is gained with output circuit opened. Similarly, check the right channel as well.

* When relay is off, turn power "off" and unit for a while before turning it "on". Otherwise, the original conditions are not restored even when the circuit and load are normal.

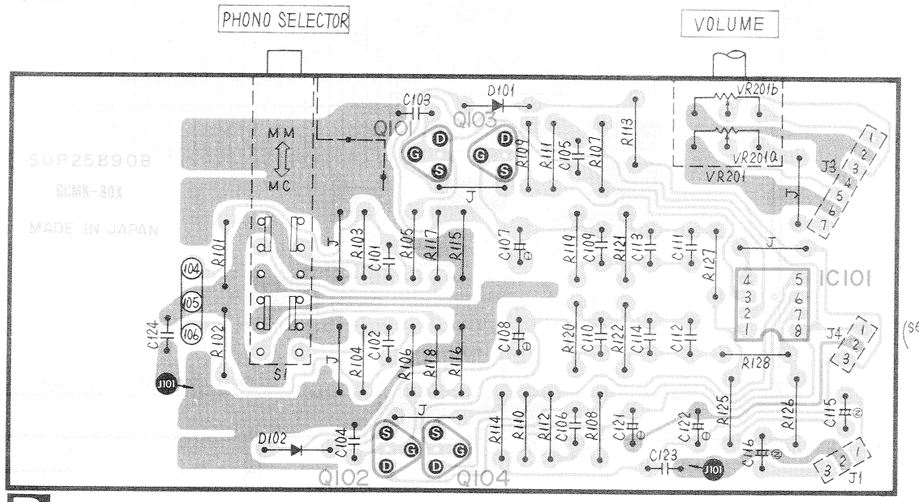
■ PRINTED CIRCUIT BOARDS

Ground (Earth) lines

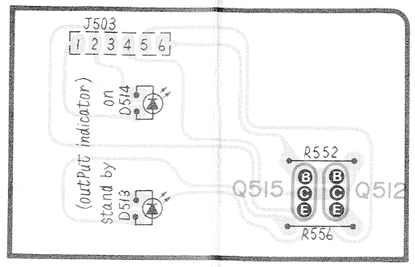
A INPUT-OUTPUT CIRCUIT



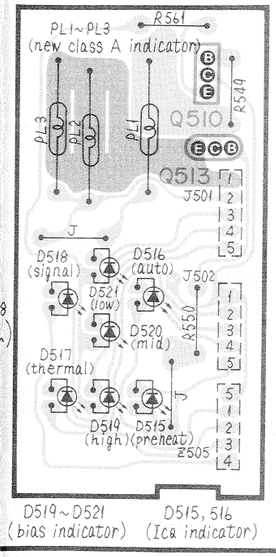
B MM-MC SELECTOR/ EQUALIZER CIRCUIT



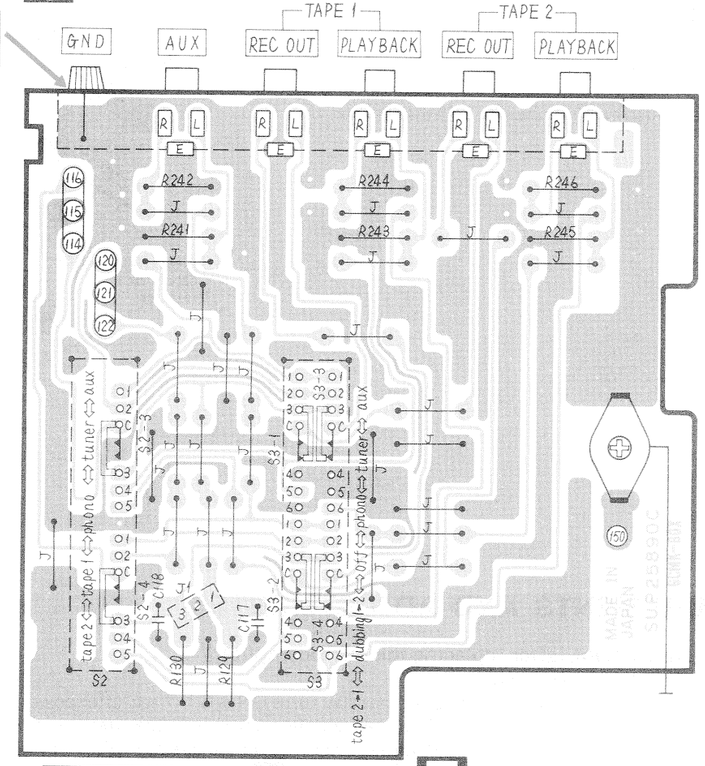
H INDICATOR DRIVE CIRCUIT



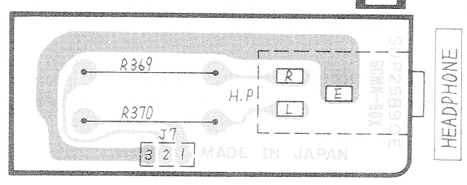
I INDICATOR DRIVE CIRCUIT



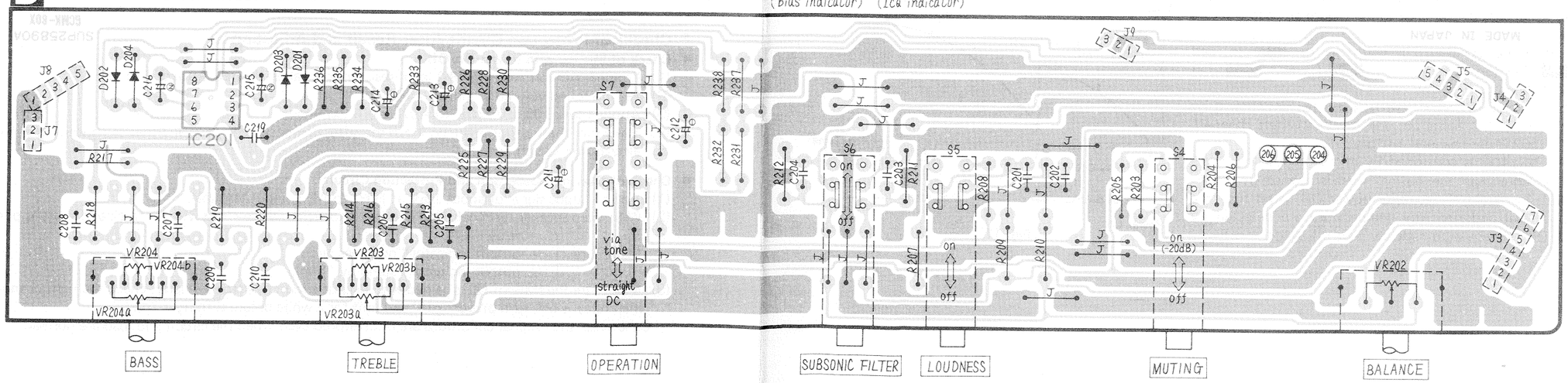
C INPUT SELECTOR CIRCUIT



E HEADPHONES CIRCUIT

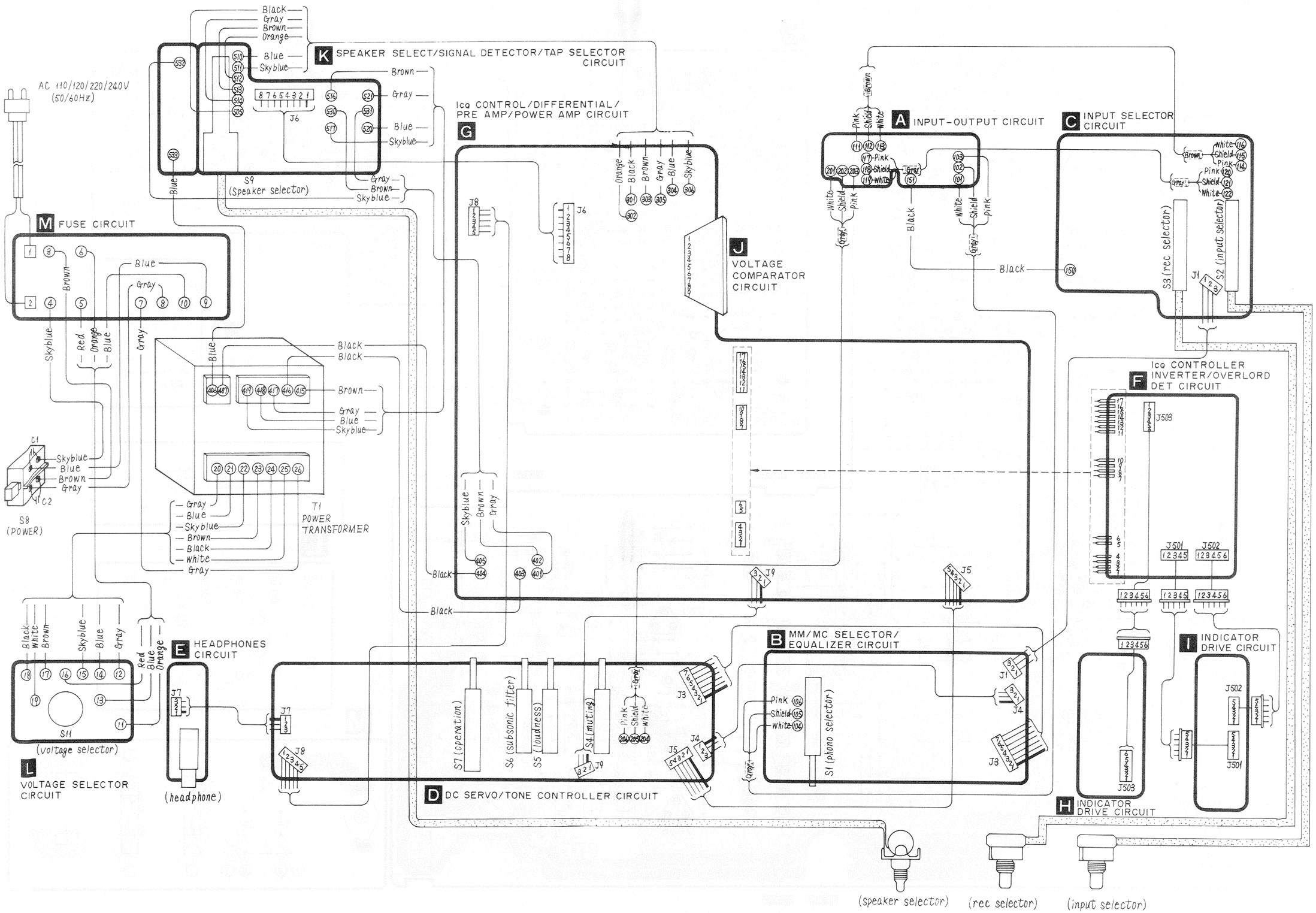


D DC SERVO / TONE CONTROLLER CIRCUIT

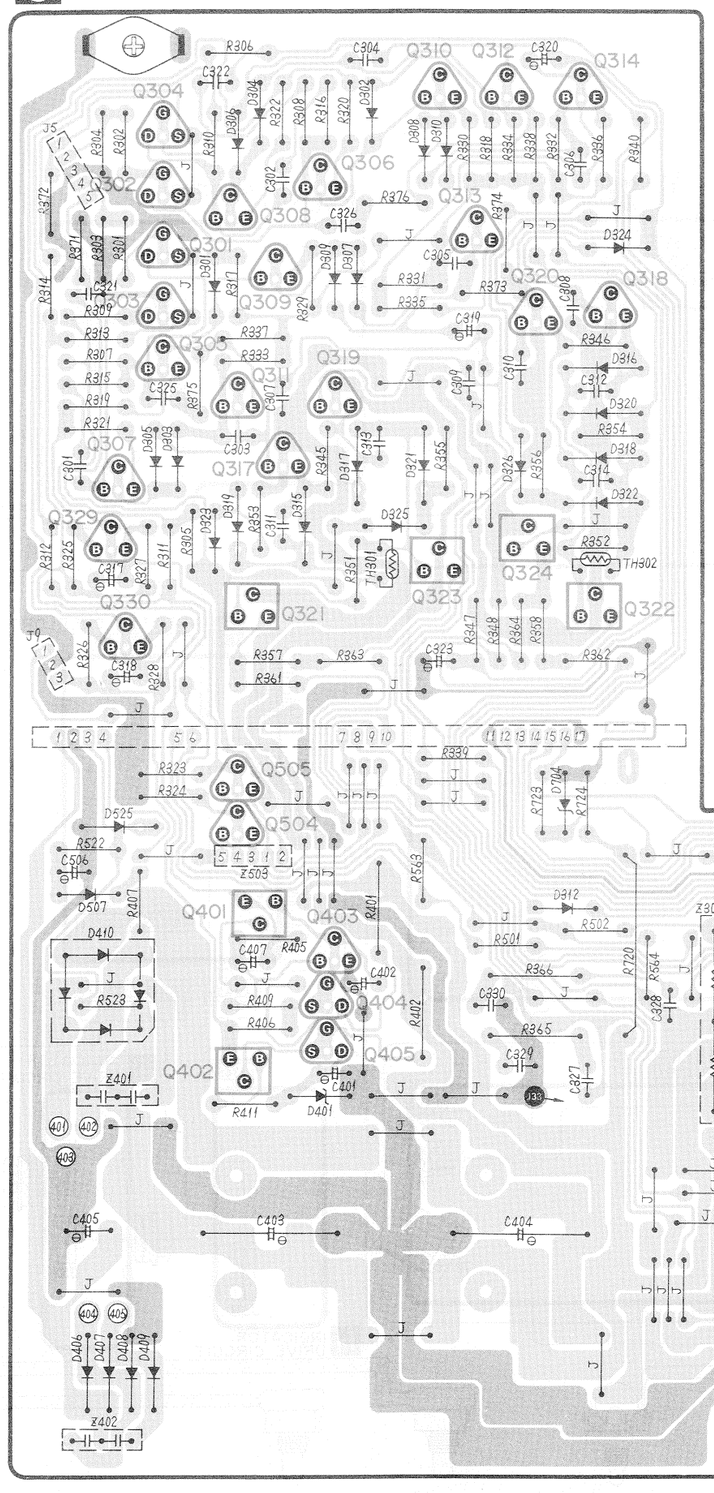


SU-V707

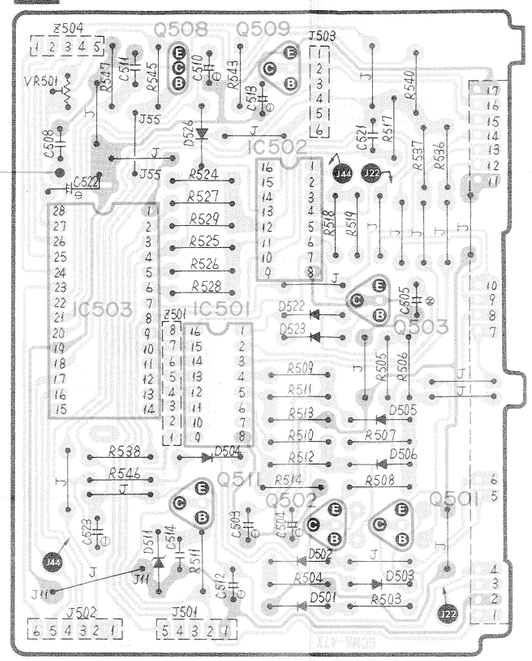
■ CIRCUIT BOARDS AND WIRING CONNECTION DIAGRAM (Top View)



G ICQ CONTROL / DIFFERENTIAL / PRE AMP / POWER AMP CIRCUIT



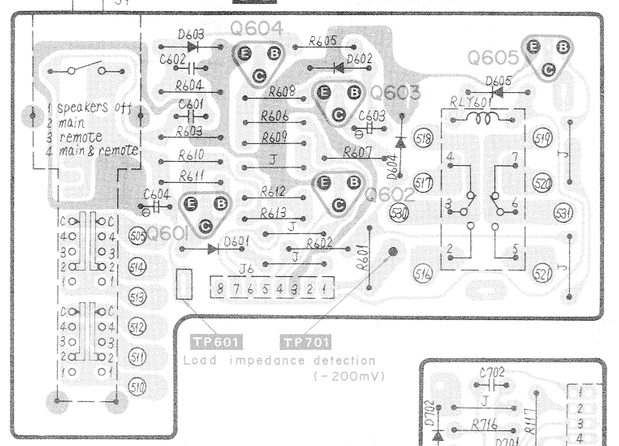
F ICQ CONTROLLER / INVERTER / OVERLORD DET CIRCUIT



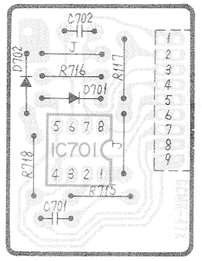
SPEAKERS SELECTOR

S9

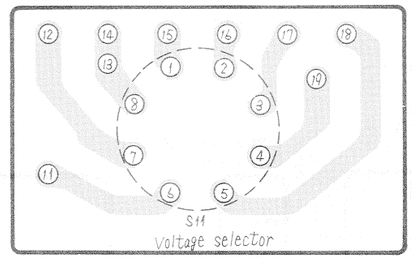
K SPEAKER SELECT / SIGNAL DETECTOR / TAP SELECTOR CIRCUIT



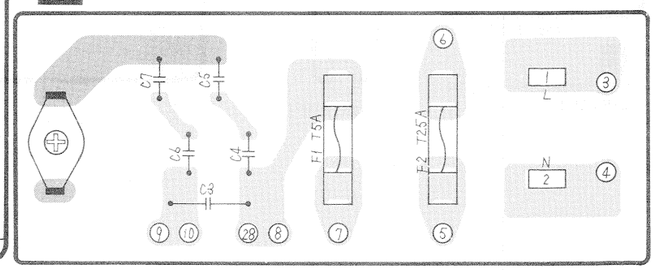
J VOLTAGE COMPARATOR CIRCUIT



L VOLTAGE SELECTOR CIRCUIT



M FUSE CIRCUIT



2. Description of Speaker Impedance Detection Circuit

This circuit serves to detect the impedance of speaker connected to the speaker terminals and to change the secondary tap voltage of power transformer according to the speaker impedance. It consists of a voltage comparing circuit, reset circuit, detection signal generating circuit, and speaker select relay drive circuit.

1) Reset circuit and detection signal generating circuit

The reset switch of speaker select switch is short-circuited only when the switch is shifted, With the speaker select switch shifted, the reset switch is short-circuited, then Q601 of reset circuit turns ON. When Q601 turns ON, positive voltage as in Fig. 18-A is generated at the collector of Q601, causing Q602 to turn ON.

When Q602 turns ON, Q701 turns OFF, and so does RLY501.

Also, when Q701 turns OFF, the collector potential of Q701 becomes positive, causing Q605 to turn OFF.

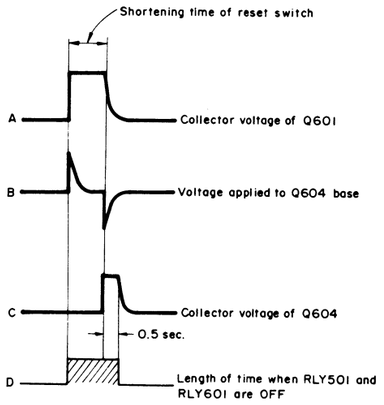
Then RLY601 also turns OFF (high volt tap).

When the reset switch is open, a voltage as in Fig. 18-B is applied to the base of Q604 due to the charge and discharge of C601.

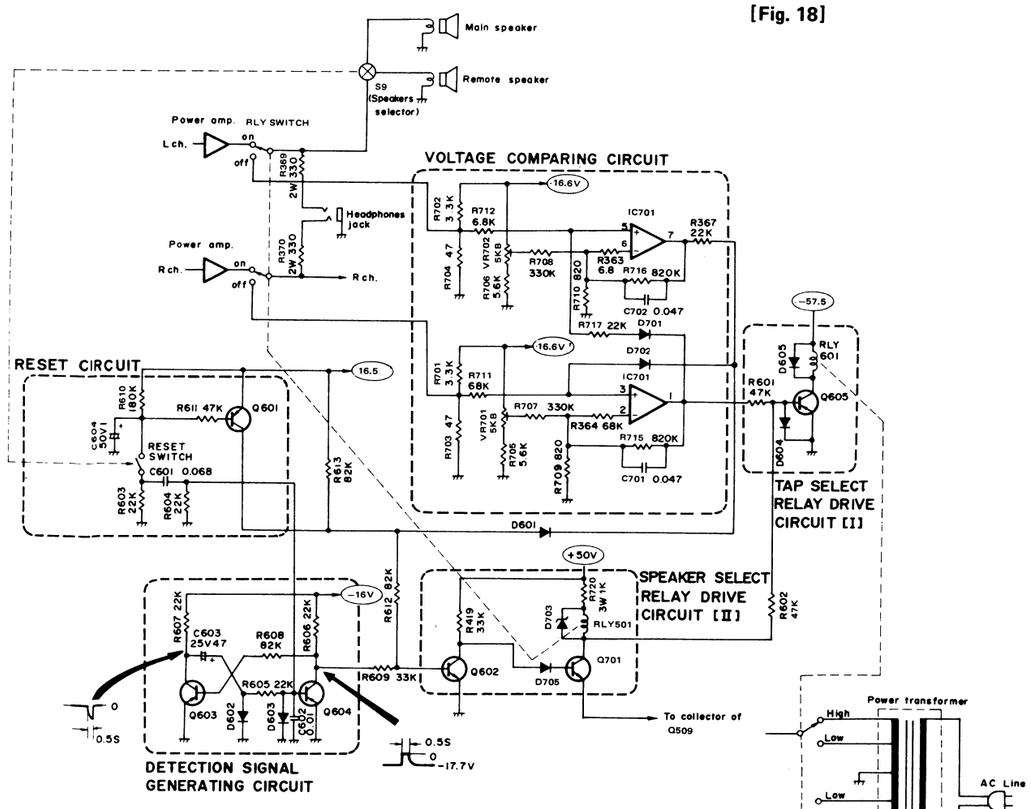
With Q604 turned ON, a voltage as in Fig. 18-C is generated at the collector of Q604. The voltage causes Q602 to turn ON.

When Q602 turns ON, RLY501 turns OFF and so does RLY601 (high volt tap). That is, both RLY501 and RLY601 are OFF during short-circuit of reset switch and for 0.5sec. more after opening the switch.

Also, when power switch is turned ON, C604 is charged with voltage, then the base voltage of Q601 becomes 0V and Q601 turns ON. Then both RLY501 and RLY601 turn OFF, and the speaker impedance detecting circuit operate. About 0.5sec. after power switch ON, C604 is discharged and Q601 turns OFF.



[Fig. 18]



[Fig. 19]

2) Voltage comparing circuit

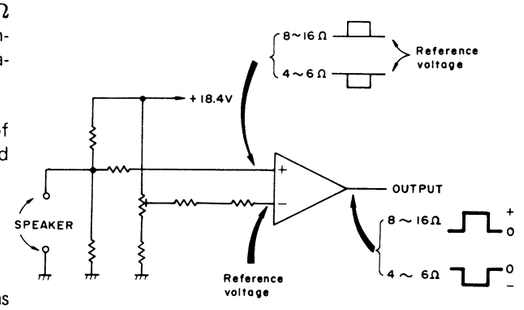
IC701 is a voltage comparing circuit. With RLY501 turned OFF, the speaker is connected to the voltage comparing circuit. (Fig. 20) The reference voltage is applied to minus terminals (②, ⑥) of IC701.

Also, plus terminals (③, ⑤) of IC701 are subject to change according to the impedance of the speaker connected to the set.

The adjustment has been made with VR701 and VR702 so that the output voltage of IC701 is 0V with 6.5Ω speaker connected. If the impedance of the speaker connected is 4Ω, the output voltage of IC701 becomes negative, causing Q605 to turn ON.

Then RLY601 also turns ON (low volt tap).

If the speaker impedance is 8Ω, the output voltage of IC701 becomes positive, then Q605 turns OFF and RLY601 also turns OFF (high volt tap).



[Fig. 20]

3) Voltage comparing circuit and reset circuit

The operation amplifier of voltage comparing circuit has a nature to hold the impedance 8Ω, or 4Ω once detected. So, if a speaker with different impedance is connected, it is necessary to turn OFF the power supply or shift the speaker select switch before operating the reset circuit.

■ FUNCTION OF TERMINAL (I_{CQ} CONTROLLER IC503)

Pin No.	Mark	Name of block	Description of terminal
1	Vss	Power supply input terminal	Grounded (0V)
2	CO_9	Output port C	It delivers Ico control signal through input port A (thermal sensor) and input port B (signal sensor). [Output "L"]
3	CO_8		
4	CO_7		
5	CO_6		
6	CO_5		
7	AI_3	Input port A	When DC detection circuit of power amplifier operates, the input level becomes "H".
8	AI_2		When 125°C (257°F) sensor of power amplifier operates, the input level becomes "H".
9	AI_1		When 100°C(212°F) sensor of power amplifier operates, the input level becomes "L".
10	AI_0		When 60°C (140°F) sensor of power amplifier operates, the input level becomes "L".
11	BI_3	Input port B	Input level changes to "L" as effective output 2V signal sensor of power amplifier operates. (L ch.)
12	BI_2		Input level changes to "L" as effective output 5V signal sensor of power amplifier operates. (L ch.)
13	BI_1		Input level changes to "L" as effective output 2V signal sensor of power amplifier operates (R ch.)
14	BI_0		Input level changes to "L" as effective output 5V signal sensor of power amplifier operates (R ch.)
15	EO_0	Output port E	Indicator "thermal" lights up at "L" output.
16	EO_1		Indicator "signal" lights up at "L" output.
17	EO_2		Indicator "auto" lights up at "L" output.
18	EO_3		Indicator "stand by" lights up at "L" output.
19	TST	Test input terminal	Terminal for testing LSI (Grounded)
20	RST	Reset input terminal	All outputs are cleared or reset with input at "L" (It is connected to power supply circuit)
21	SNS_0	Sensor input terminal	Conditional transfer (branach) is performed according to the input level.
22	SNS_1		Input level changes to "H" as power amplifier output short-circuit operates.
23	DO_0	Output port D	Output terminal for indicator "preheat" and preheating circuit operation. [Output "L"]
24	DO_1		Not used in this unit.
25	DO_2		
26	DO_3		Output relay turns ON with output at "H"
27	VDD	Power supply input terminal	Apply 5V.
28	OSC	OSC input terminal	Clock signal (about 400 kHz) can be obtained by internal oscillation circuit.

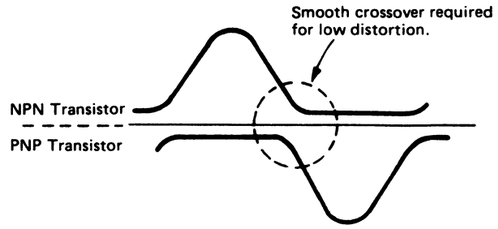
■ TECHNICAL INFORMATION

1. Description of Computer drive system

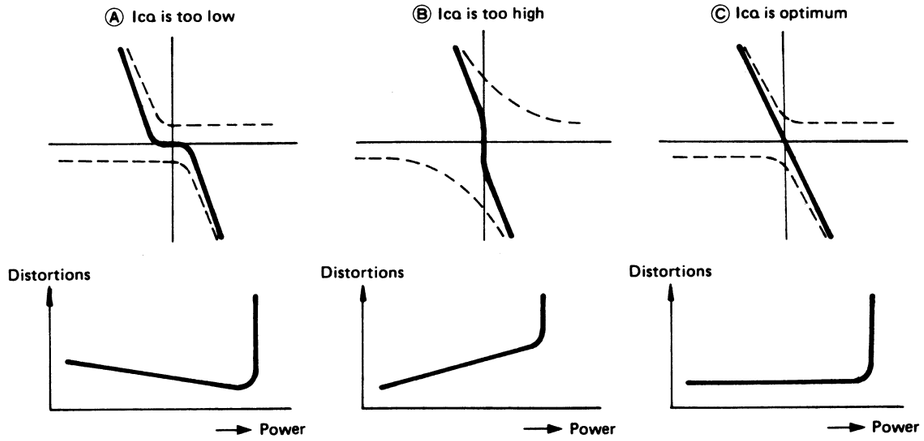
Technics New Class A amplifier circuitry eliminates switching and crossover distortion. To further improve fidelity a "computer drive" circuit has been incorporated to eliminate transient distortion in music signal reproduction.

• Power transistor idling current (Icq)

The idling current through the power transistors is adjusted so that crossover distortion is minimized when switching from the NPN transistor to the PNP transistor in a complimentary design (Fig. 12).
If Icq is not adjusted properly, distortion will result as in Fig. 13.



[Fig. 12]

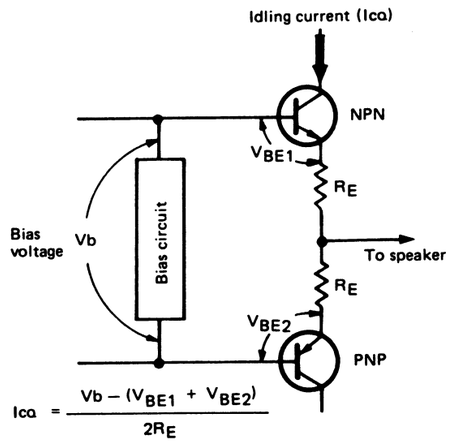


Relationship between idling current level and cross-over distortion.

[Fig. 13]

• Idling current and bias current

Idling current is determined by the bias voltage (Vb) of the bias circuit and the V_{BE} of each power transistor (Fig. 14). The V_{BE} varies according to the temperature of the transistor. This temperature varies instantaneously with the music signal. Unfortunately, with current designs, these instantaneous fluctuations cannot be detected due to the placement of the thermal sensor and the slow temperature change of the heat sink. Attempts have been made to include a thermal sensor as part of the output power pack. However, most power packs do not include a thermal sensor. Also, this method does not work if discrete components are used. We are still faced with the problem of stable bias operation and fast response to abrupt changes in temperature.

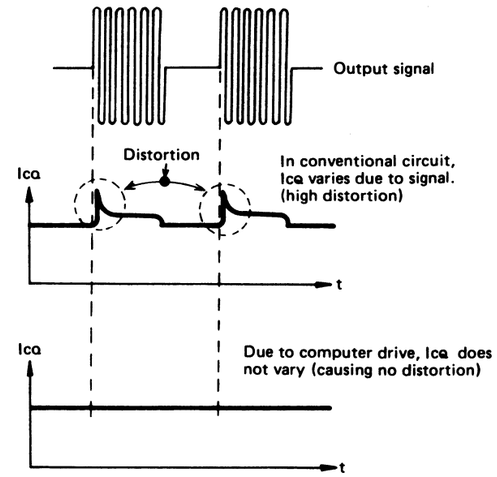


[Fig. 14]

• Computer drive system

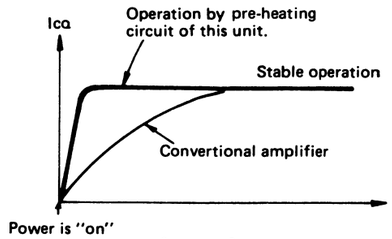
Knowing the thermal and signal characteristics of the power transistors, a system can be designed to calculate the instantaneous temperature changes and adjust for the optimum idling current. Information regarding the transistor ambient temperature and the input music signal is obtained through sensors and fed to a computer. The computer calculates the optimum idle current and maintains it at a constant level by varying the bias voltage. Figure 15 illustrates the relationship of the output signal and the idling current. Figure 17 is a block diagram of the "computer drive" system.

Generally, it takes several minutes for the power transistors to reach the temperature of stable operation after the power is turned on. To ensure stable and optimum performance quickly, the microcomputer forces a large amount of idling current through the power transistors for a short time. This rapidly "preheats" the transistors and the heat sink. Figure 16 illustrates the stable operation level for the convertional and new computer drive system.

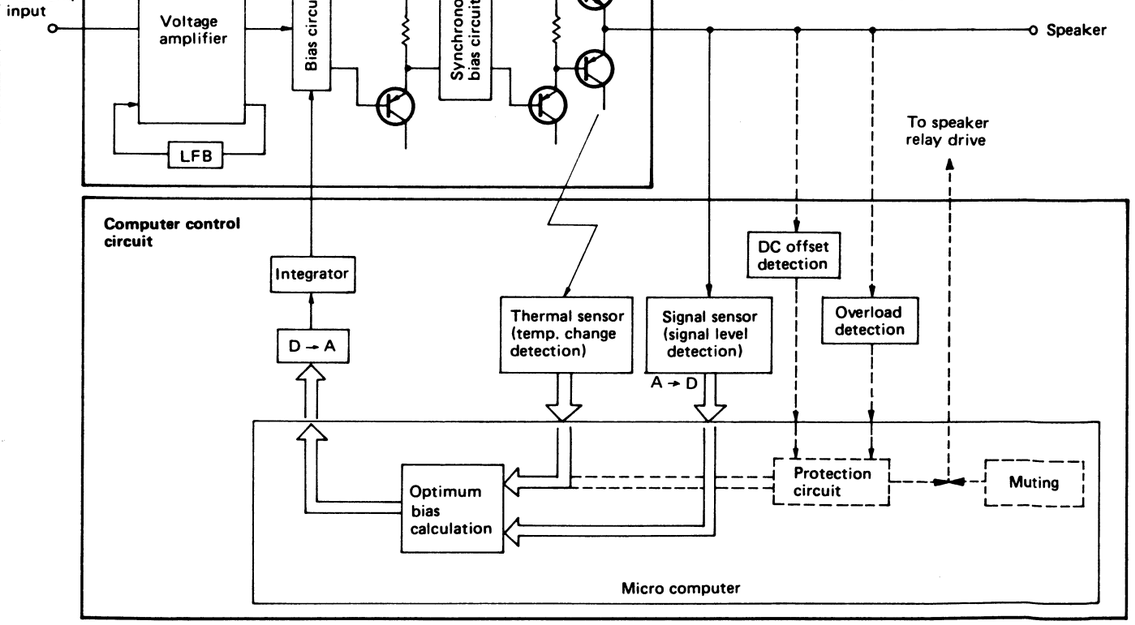


Output vs idling current

[Fig. 15]



[Fig. 16]

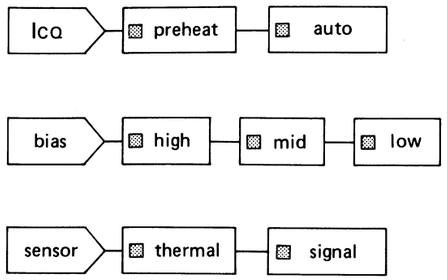


[Fig. 17]

■ OPERATION OF ICQ CONTROLLER

- **Computer drive monitor indicators**

These indicators are used to check that stable idling current flows from the bias circuit in order to prevent transient crossover distortion.



ICQ:
When the power is switched on, the radiator is preheated so that the bias circuit can immediately operate. The "preheat" indicator will illuminate at this time, and then, when the circuit is fully stabilized, the "auto" indicator will illuminate.

bias:
When the power is switched on, the bias changes from high, mid and low during the time until the idling current becomes stabilized, and the respective indicators illuminate.
Note that the display will no longer illuminate when the idling current has reached a condition of stability.

sensor:
The "thermal" sensor detects the temperature of the output transistor(s) and radiator, and the "signal" sensor detects the music signal level. Both indicators will illuminate when the sound can be heard.

- **Output indicators**

These indicators show the condition of the signal sent to speakers or headphones.
When the power switch is switched on, the "stand by" indicator flashes, and, when the unit is operating normally, the "on" indicator will illuminate.
Note that the "stand by" indicator will flash if the positive and negative speaker terminals or speaker connection cords are short-circuited, or if some other circuit abnormality which causes the protection circuit to function is detected. If this occurs, switch the power switch off, and then on again after first determining the cause of the problem and correcting it.

- **ON-time of each indicator, and output generated at pin terminal of microcomputer (IC503)**

▒▒ "ON" (light up) time

Output port	(4) pin CO_7	(3) pin CO_8	(2) pin CO_9	(15) pin EO_0	(16) pin EO_1	(17) pin EO_2	(18) pin EO_3	(26) pin DO_3	(23) pin DO_0
Ind. / sec.	bias low	bias mid	bias high	sensor thermal	sensor signal	ICQ auto	output stand by	output on	ICQ preheat
Power "ON"	Ⓛ	Ⓛ	Ⓛ	Ⓛ	Ⓛ	Ⓛ	Ⓛ	Ⓛ	Ⓛ
0.4 sec.									
0.8 sec.	Ⓗ	Ⓗ				Ⓗ	Ⓗ		
0.4 sec.							Ⓛ		
0.4 sec.							Ⓗ		
0.4 sec.							Ⓛ		
0.4 sec.		Ⓛ	Ⓗ		Ⓗ		Ⓗ		
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0.4 sec.							Ⓗ		
0.4 sec.							Ⓛ		
0.4 sec.	Ⓛ	Ⓗ					Ⓗ		
0.4 sec.							Ⓛ		
0.4 sec.							Ⓗ		
6 sec.									
14 sec.	Ⓗ		Ⓛ	Ⓛ	Ⓛ			Relay ON	
∫						Ⓛ		Ⓗ	Ⓗ

* 125°C (257°F) sensor is for protection of circuit. ICQ is not controlled.

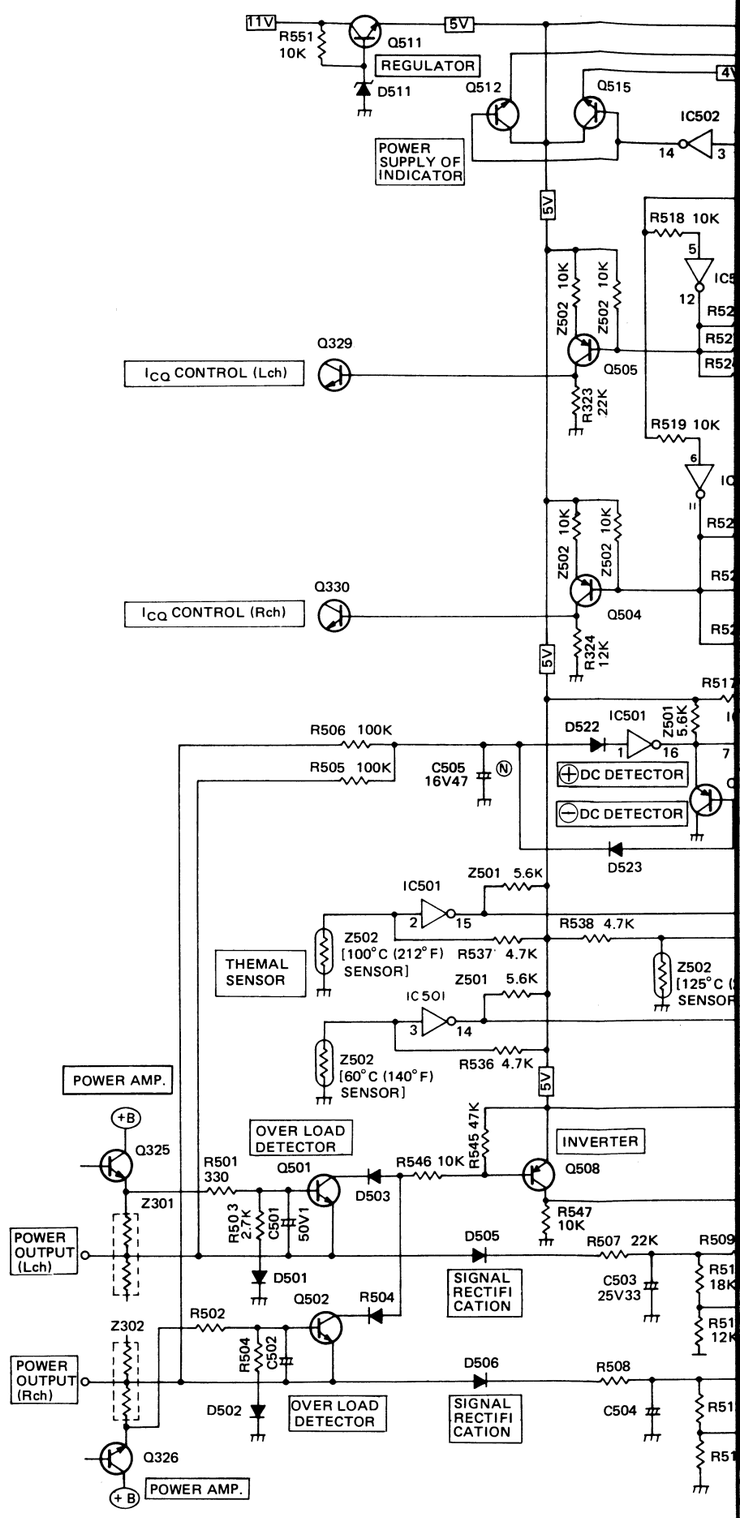
[Fig.21]

1) Preheat
When power supply is turned ON, the level of IC503 pin ㉓ becomes low. At the same time, preheat LED (D515) lights up, Q513 turns OFF and so does the computer drive lamp. Also, Q510 turns ON, then voltage is applied to LED's (D519), (D520), (D521). Each of D519, D520 and D521 is controlled by IC503 pins ② ~ ⑤ and ⑥ respectively. The output voltages are shown in Fig. 21 . The "high" LED lights up first, followed by "mid" LED, and then "low" LED. IC503 pin ⑰ turns power supply ON as in Fig. 21 . It becomes "H" 0.4 sec. later, then IC502 pins ⑤ and ⑥ also becomes "H". IC502 pins ⑫ and ⑪ changes to "L" and it is applied to Q504 and Q505, causing Q504 and Q505 to turn ON. IC502 pins ⑫ and ⑪ delivers a large ICQ for 6 sec. after power ON (while pins ⑫ and ⑪ are "L"), and after that, pin ⑫ and ⑪ become "H". ICQ is controlled by the output of IC503 pins ② ~ ⑤ and ⑥

2) Power on/off muting
When power supply is turned ON, the output of IC503 pin ㉖ is "L" for about 6 sec. as in Fig. 21 , then relay RLY501 turns OFF, and D514 output "on" LED also turns OFF. The voltage of IC503 pin ⑱ alternately becomes "L" and "H" for 6 sec. after power ON as in Fig. 21 , causing D513 "stand by" LED to blink. IC503 pin ㉖ output becomes "H" 6 sec. after power ON, then relay RLY501 turns ON and D514 output "on" LED lights up.
When power supply is turned OFF, "H" is applied to IC502 pin ④ and IC502 pin ⑬ output changes to "L" because the time constant of C506 (3.3μF) and R522 (15kΩ) is smaller than that of C403 (15000μF) and R523 (120kΩ). The signal is put into IC503 pin ⑳ while "L" output is delivered to IC503 pin ㉖ . When pin ㉖ becomes "L", Q509 turns OFF and so does relay RLY501.

3) DC detection circuit
When the power amplifier voltage is over 2V DC. IC501 pin ① (⊕ DC detection) and Q503 (⊖ DC detection) are turned ON, then "H" input is applied to IC503 pin ⑦ , and "L" output is delivered to IC503 pin ㉖ . When pin ㉖ becomes "L", relay RLY501 turns OFF the same as in power-off muting.

4) Overload detector circuit
When speaker terminals are short-circuited, a large amount of current flows into Z301 (Z302), and the base voltage of Q501 (Q502) increases, causing Q501 (Q502) and Q508 to turn ON. As Q508 turns ON, "H" input is applied to IC503 pin ㉒ , and "L" output is delivered to IC503 pin ㉖ . When pin ㉖ becomes "L", relay RLY501 turns OFF the same as in power off muting.
When "H" is applied to IC503 pin ㉒ , the output of IC503 pin ㉖ is held. Therefore, turn off the power switch and check the set beforehand. Otherwise, relay RLY501 will not turn ON.



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ON	
	Ⓗ

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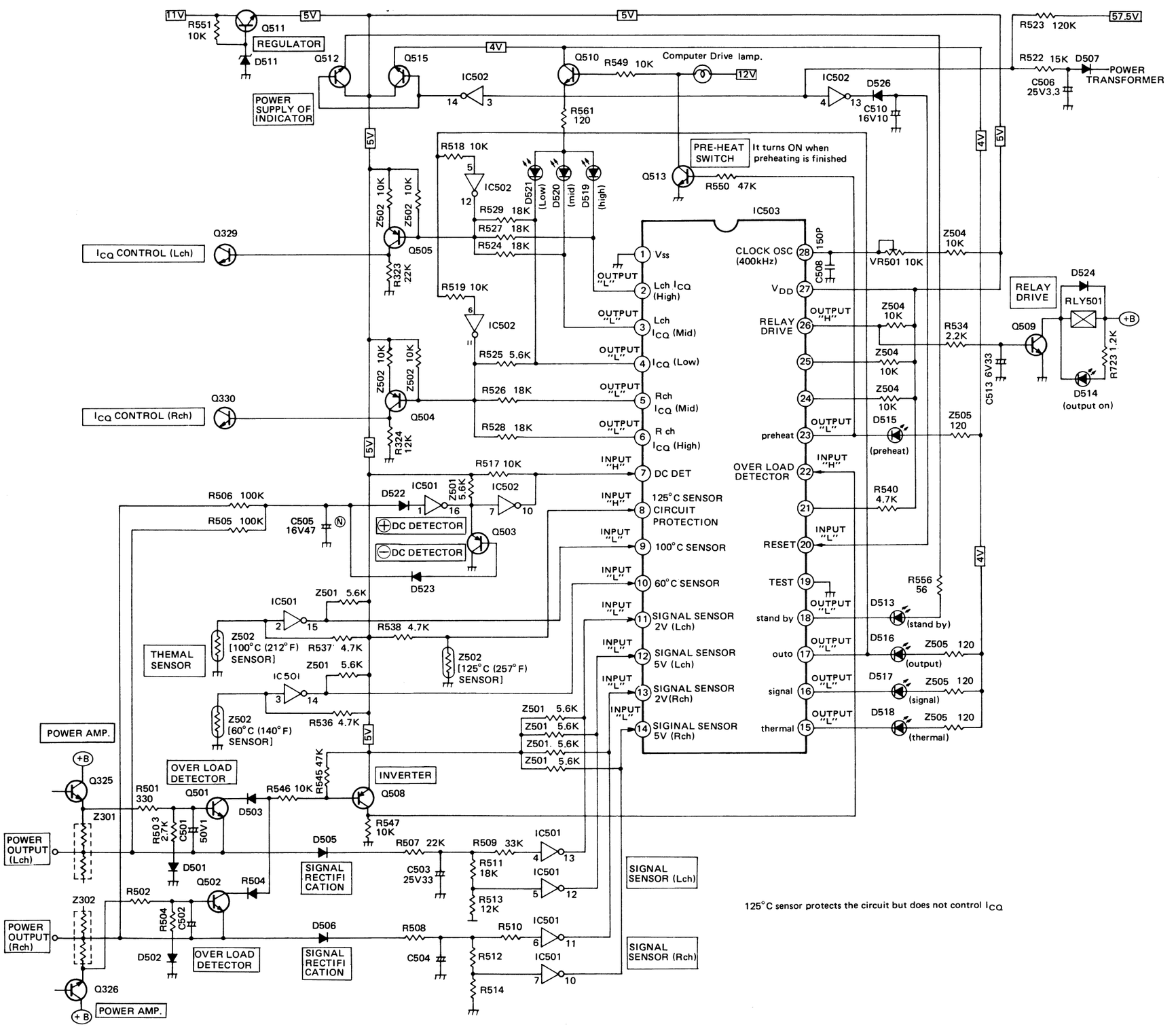
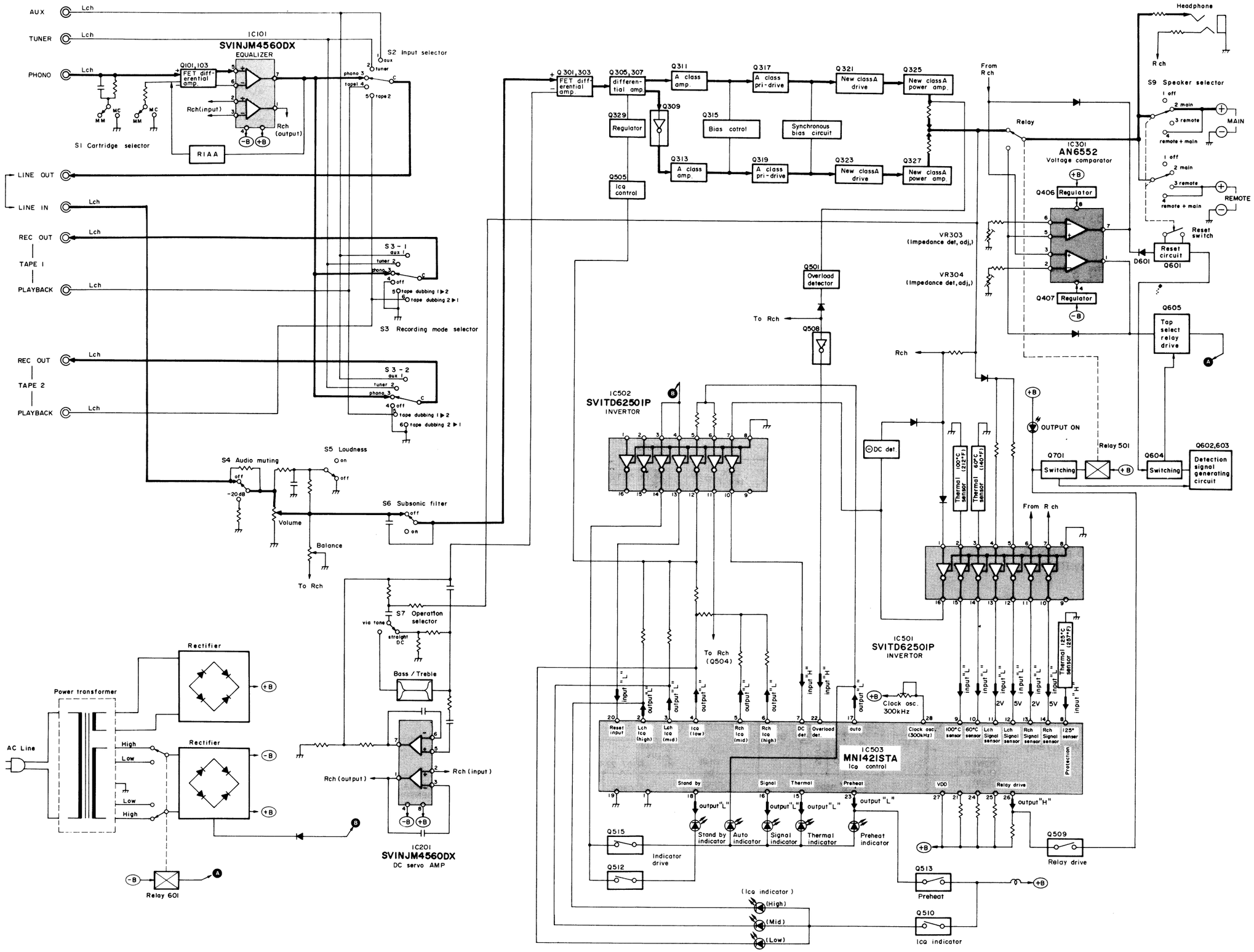


SU-V707 SU-V707

■ BLOCK DIAGRAM



■ SCHEMA

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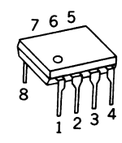
- **Terminal guide**

SVITD62501	1
MN1421STA	2

SVINJM4560DX, AN6552



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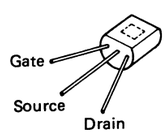
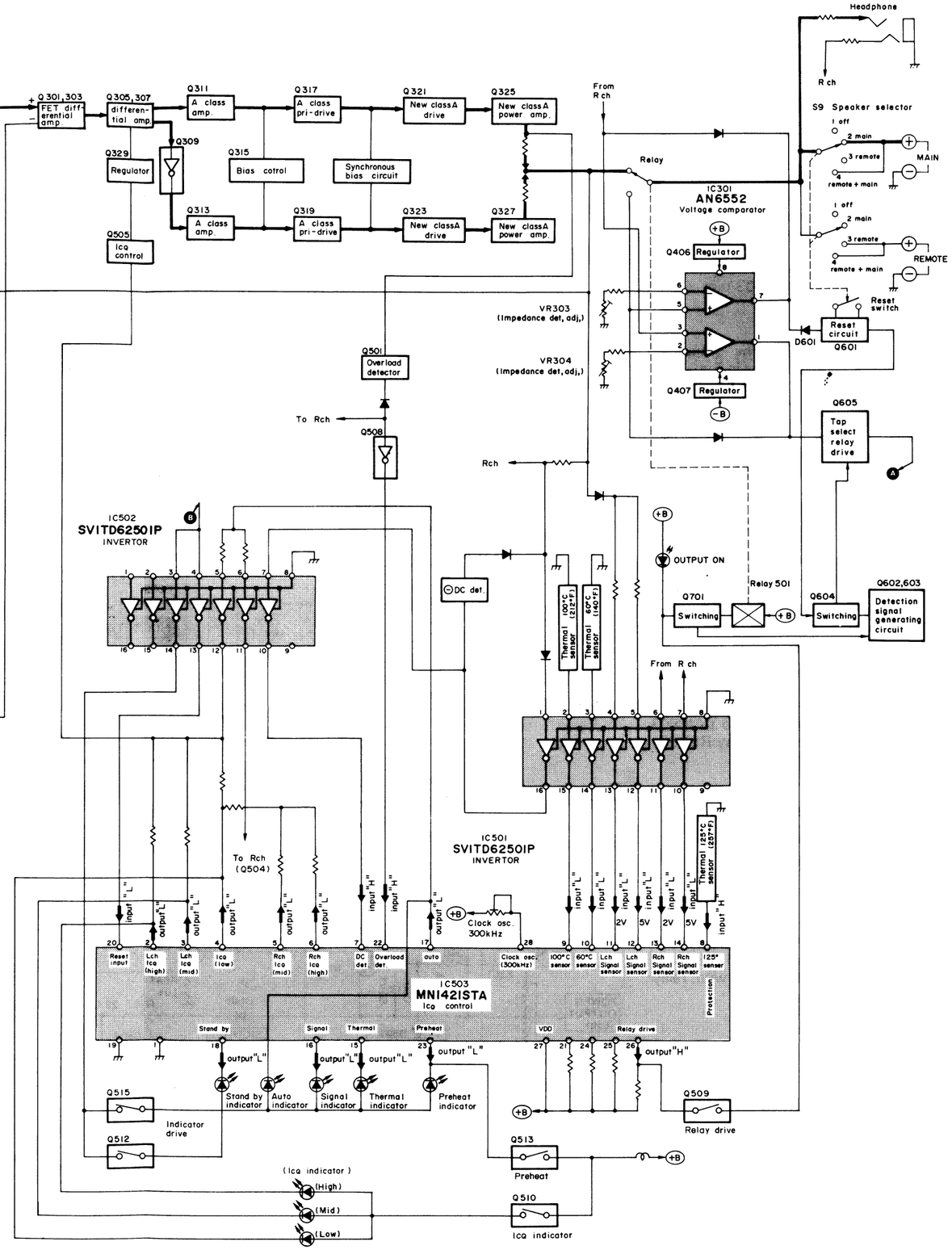




■ SCHEMATIC DIAGRAM

(This schematic diagram may be modified at any time with the development of new technology.)

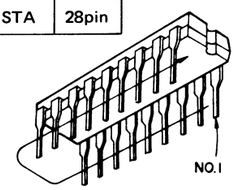
- **The part No. of transistors, IC and diodes mentioned in the schematic diagram stand for production part No. Regarding the part No. with ✪ mark, the production part No. are different from the replacement part No. Therefore, when placing an order for replacement parts, pleases use the part No. in the replacement parts list.**

Notes:

1. **S1** : Phono cartridge selector switch in **"MM"** position. MM ↔ MC
2. **S2-1 ~ S2-4** : Input selector switch in **"phono"** position. 1. aux ↔ 2. tuner ↔ 3. phono ↔ 4. tape 1 ↔ 5. tape 2
3. **S3-1 ~ S3-4** : Recording-mode selector switch in "**off**" position. 1. aux ↔ 2. tuner ↔ 3. phono ↔ 4. off ↔ 5. tape dubbing 1▶2 ↔ 6. tape dubbing 2 ▶1
4. **S4** : Muting switch in "off" position. [■ off, ▂ on (– 20dB)]
5. **S5** : Loudness switch in "off" position. (■ off, ▂ on)
6. **S6** : Subsonic filter switch in "off" position. (■ off, ▂ on)
7. **S7** : Operation switch in "straight DC" position. (■ straight DC, ▂ via tone)
8. **S8** : Power source switch in "**on**" position.
9. **S9** : Speaker selector switch in "**main**" position. (Speakers off ↔ main ↔ remote ↔ main and remote)
10. **S9** : Voltage selector switch in "**240V**" position. 120 ↔ 110V ↔ 220V ↔ 240V
11. Important safety notice: Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
12. ▭ indicated voltage values are the standard values for the DC electronic circuit tester (high impedance) with the ground point taken as standard. Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester. (high tap)
    * ( ) Low tap
13. ▒▒▒ Phono signal lines
14. ▬▬ Positive (+B) voltage lines
15. ▬▬▶ Negative (–B) voltage lines

• Terminal guide of transistors, diodes and IC's

SVITD62501	16pin
MN1421STA	28pin



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		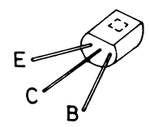	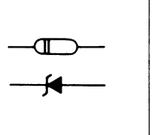	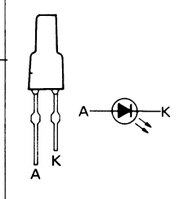	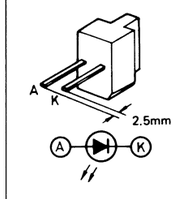
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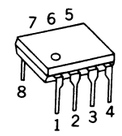
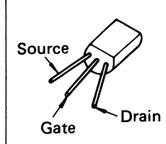
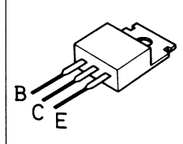
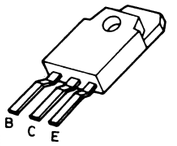
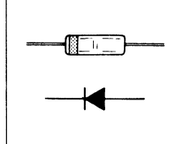
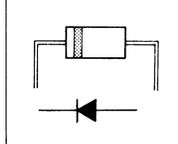
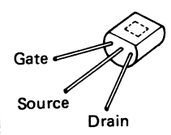
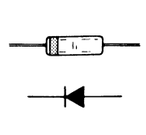
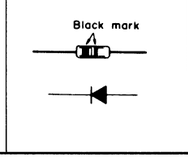
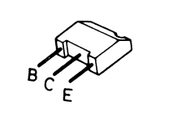
					
2SK369	MA27W-A	MA162A	2SD661, 2SB745, 2SB941		
					

A Input-Output terminal circuit

SUP 25890D

PHONO L R
TUNER L R
OUTPUT L R
EXTERNAL TERMINAL
INPUT L R

MM/MC cartridge selector

B MM/MC selector/ Equalizer circuit

SUP 25890B

Q101 ~ 104 2SK369 FET DIFFERENTIAL AMP

IC101 SVIN JM4560DX EQUALIZER

D101, 102 MA150

Volume control

Balance

D DC servo/Tone controller circuit

SUP 25890A

IC201 SVIN JM4560DX DC SERVO AMP

Subsonic filter

Bass control

Treble control

Operation

Loudness

Audio muting

D201 ~ 204 MA150

NFB

LFB

ICQ control/Differential/Pre amp/Power amp circuit

Q504,505	Q329,330	Q323,324	Q325,326	Q327,328
2SA1015	2SC1685NC	2SA1112R	2SC3182	2SA1265
ICQ CONTROL	REGULATOR	DRIVE	POWER AMP	POWER AMP

D301 ~ 304, 307, 308 MA150

D305, 306, 309, 310 MA162A

D315 ~ 322 0A90

C Input selector circuit

SUP 25890C

S2 (INPUT SELECTOR) 1. aux 2. tuner 3. phono 4. tape 1 5. tape 2

Input selector

Rec selector

S3 (REC SELECTOR) 1. aux 2. tuner 3. phono 4. off 5. dubbing 1▶2 6. dubbing 2▶1

(Lch) AUX
REC OUT TAPE 1 PLAYBACK
REC OUT TAPE 2 PLAYBACK
GND
(Rch) AUX
REC OUT TAPE 1 PLAYBACK
REC OUT TAPE 2 PLAYBACK

E Headphones circuit

SUP 25890E

HEADPHONES

Clock OSC 400kHz

IC501, 502 SVITD62501P INVERTER

Q501, 502 2SC1845 OVER LORD DET

Q503 2SA1015 DC DET

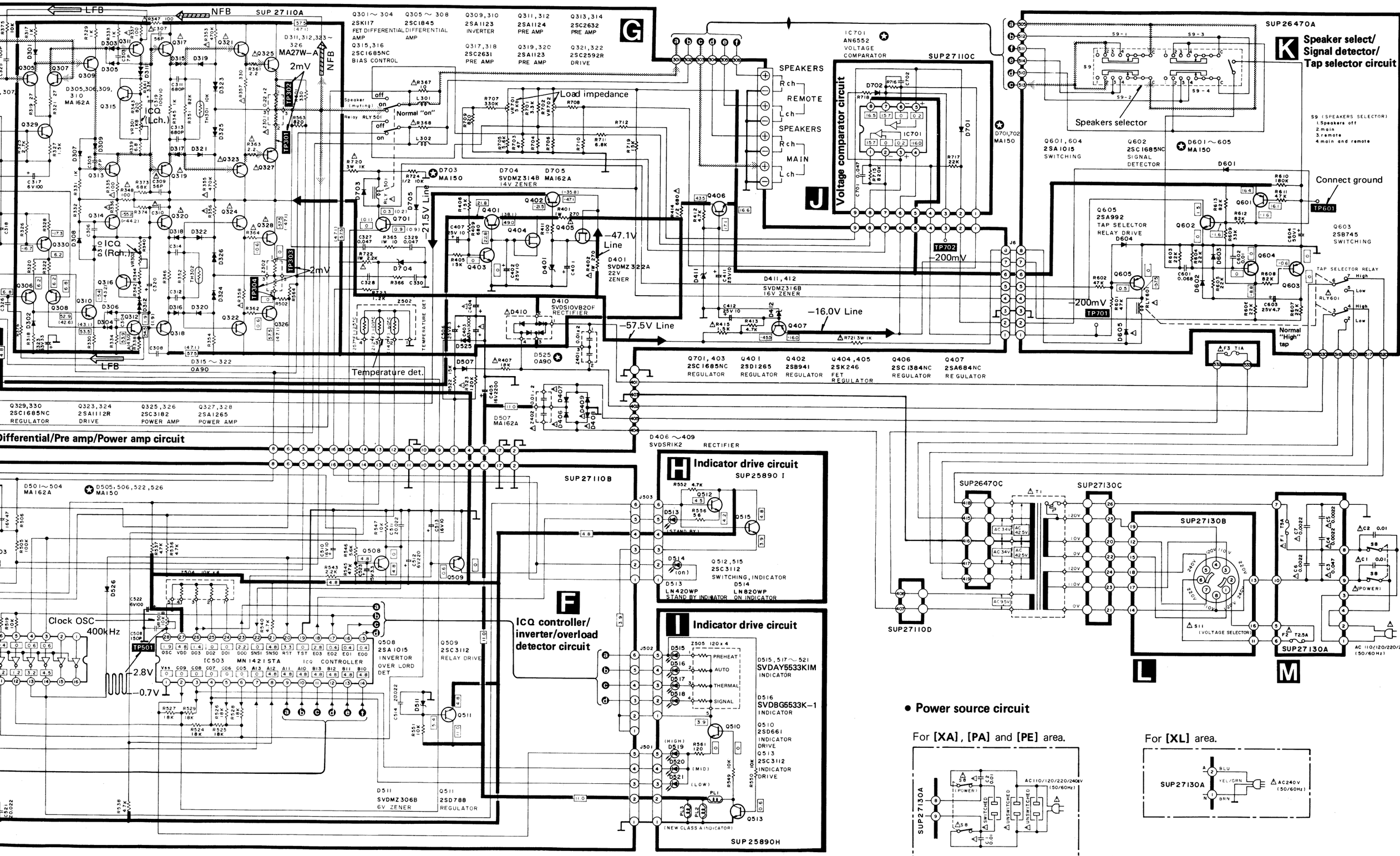
D501 ~ 504 MA162A

D505, 506, 522, 526 MA150

D523 MA27W-A

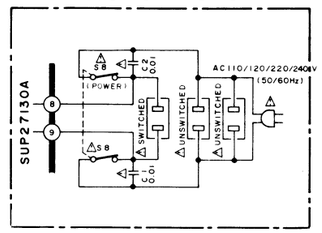
TP501 -2.8V -0.7V

9 10 11 12 13 14 15 16 17 18



• Power source circuit

For **[XA]**, **[PA]** and **[PE]** area.



For **[XL]** area.

■ RESISTORS & CAPACITORS

Notes: 1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. Important safety notice: Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
3. The "**S**" mark is service standard parts and may differ from production parts.
4. The unit of resistance is Ω(ohm), K = 1000Ω, M = 1000kΩ.
5. The unit of capacitance is μF (microfarad). P = 10^{-6} μF
6. Bracketed indications in Ref. No. columns spedify the area. Parts without these indications can be used for all areas.

Resistor Type	Wattage	Tolerance
ERD : Carbon	25 : 1/4W	J : ±5%
ERG : Metal Oxide	1 : 1W	G : ±2%
ERO : Metal Film	2 : 2W	
	3 : 3W	
	S1 : 1/2W	

Capacitor Type	Voltage		Tolerance
	ECEA Type	Other	
ECEA : Electrolytic	OJ : 6.3V	1H : 50V	C : ±0.25pF
ECCD : Ceramic	1A : 10V	KC : 400V AC	D : ±0.5pF
ECKD : Ceramic	1C : 16V	2H : 500V DC	M : ±20%
ECQM : Polyester	1E : 25V	2A : 250V AC	J : ±5%
ECET : Electrolytic	1H : 50V		K : ±10%
ECEA..... N: Non Polar Electrolytic	1J : 63V		Z : +80%, −20%
ECQE : Polyester	50 : 50V		P : +100%, −0%
	25 : 25V		
	2A : 100V		

Ref. No.	Part No.	Value
RESISTORS		
R101, 102 S	ERD25TJ473	47K
R103, 104 S	ERD25FJ221	220
R105, 106 S	ERD25FJ220	22
R107, 108 S	ERD25FJ332	3.3K
R109, 110 S	ERD25FJ332	3.3K
R111, 112 S	ERD25FJ101	100
R113, 114 S	ERD25FJ332	3.3K
R115, 116 S	ERD25FJ121	120
R117, 118 S	ERD25FJ8R2	8.2
R119, 120 S	ERO25CKF6802	68K
R121, 122	ERO25CKF5231	5.23K
R125, 126 S	ERD25FJ681	680
R127, 128 S	ERD25FJ561	560
R129, 130 S	ERD25TJ334	330K
R201, 202 S	ERD25FJ272	2.7K
R203, 204 S	ERD25TJ223	22K
R205, 206 S	ERD25FJ332	3.3K
R207, 208 S	ERD25TJ563	56K
R209, 210 S	ERD25TJ273	27K
R211, 212 S	ERD25TJ824	820K
R213, 214 S	ERD25TJ824	820K
R215, 216 S	ERD25FJ102	1K
R217, 218 S	ERD25TJ153	15K
R219, 220 S	ERD25FJ332	3.3K
R225, 226 S	ERD25TJ153	15K
R227, 228 S	ERD25FJ332	3.3K
R229, 230 S	ERD25TJ104	100K
R231, 232 S	ERD25TJ223	22K
R233, 234 S	ERD25TJ104	100K
R235, 236 S	ERD25TJ104	100K
R237, 238 S	ERD25TJ223	22K
R239, 240 S	ERD25TJ824	820K
R241, 242 S	ERD25TJ824	820K
R243, 244 S	ERD25TJ824	820K
R245, 246 S	ERD25TJ824	820K
R301, 302 S	ERD25FJ221	220
R303, 304 S	ERD25TJ224	220K
R305, 306 S	ERD25TJ823	82K
R307, 308 S	ERD25FJ682	6.8K
R309, 310 S	ERD25FJ682	6.8K
R311, 312 S	ERD25FJ391	390
R313, 314 S	ERD25FJ562	5.6K
R315, 316 S	ERD25FJ330	33
R317, 318 S	ERD25FJ102	1K
R319, 320 S	ERD25FJ270	27
R321, 322 S	ERD25FJ270	27
R323, 324 S	ERD25TJ123	12K
R325, 326 S	ERD25FJ272	2.7K
R327, 328 S	ERD25FJ152	1.5K
R329, 330 S	ERD25FJ102	1K
R331, 332 S	ERD25FJ102	1K
R333, 334 S	ERD25FJ102	1K
R335, 336⚠S	ERD25FJ101	100
R337, 338⚠S	ERD25FJ101	100
R339, 340⚠S	ERD25FJ6R8	6.8
R341, 342⚠S	ERD25FJ332	3.3K
R343, 344 S	ERD25FJ821	820
R345, 346⚠S	ERD25FJ102	1K
R347, 348⚠S	ERD25FJ101	100
R351, 352 S	ERD25TJ823	82K
R353, 354 S	ERD25TJ474	470K
R355, 356 S	ERD25TJ474	470K
R357, 358⚠S	ERD25FJ331	330
R361, 362⚠S	ERD25FJ2R2	2.2
R363, 364⚠S	ERD25FJ2R2	2.2
R365, 366 S	ERG1ANJ100	10
R367, 368⚠S	ERD25FJ100	10
R369, 370 S	ERG2ANJ331	330
R371, 372 S	ERD25FJ561	560
R373, 374 S	ERD25TJ683	68K
R375, 376 S	ERD25FJ103	10K
R401 ⚠	ERDS1FJ271	270
R402 ⚠S	ERG1ANJ271	270
R405, 406 S	ERD25TJ153	15K
R407 ⚠S	ERD25TJ183	18K
R409 S	ERD25FJ681	680
R411 ⚠	ERD2FCG101	100
R412, 413 S	ERD25FJ472	4.7K
R414 ⚠	ERDS1FJ681	680
R415 ⚠S	ERD25FJ152	1.5K
R501, 502 S	ERD25FJ331	330
R503, 504 S	ERD25FJ272	2.7K
R505, 506 S	ERD25TJ104	100K
R507, 508 S	ERD25TJ223	22K
R509, 510 S	ERD25TJ333	33K
R511, 512 S	ERD25FJ183	18K
R513, 514 S	ERD25FJ123	12K
R517, 518 S	ERD25FJ103	10K
R519 S	ERD25FJ103	10K
R522 S	ERD25TJ153	15K
R523 S	ERD25TJ124	120K
R524, 525 S	ERD25TJ183	18K
R526, 527 S	ERD25TJ183	18K
R528, 529 S	ERD25TJ183	18K
R536, 537 S	ERD25FJ472	4.7K
R538 S	ERD25FJ472	4.7K
R540 S	ERD25FJ472	4.7K
R543 S	ERD25FJ222	2.2K
R545 S	ERD25TJ473	47K
R546 S	ERD25FJ562	5.6K
R547 S	ERD25FJ103	10K
R549, 550 S	ERD25FJ103	10K
R551 S	ERD25FJ103	10K
R552 S	ERD25FJ472	4.7K
R556 S	ERD25FJ560	56
R561 S	ERD25FJ121	120
R563, 564 S	ERD25FJ821	820
R601, 602 S	ERD25TJ473	47K
R603, 604 S	ERD25TJ223	22K
R605, 606 S	ERD25TJ223	22K
R607 S	ERD25TJ223	22K
R608 S	ERD25TJ823	82K
R609 S	ERD25TJ333	33K
R610 S	ERD25TJ184	180K
R611 S	ERD25TJ473	47K
R612, 613 S	ERD25TJ823	82K
R701, 702 S	ERD25FJ332	3.3K
R703, 704 S	ERD25FJ470	47
R705, 706 S	ERD25FJ562	5.6K
R707, 708 S	ERD25TJ334	330K
R709, 710 S	ERD25FJ821	820
R711, 712 S	ERD25FJ682	6.8K
R715, 716 S	ERD25TJ824	820K
R717, 718 S	ERD25TJ223	22K
R719 S	ERD25TJ153	15K
R720, 721⚠S	ERG3ANJ102	1K
R722 ⚠S	ERG1ANJ222	2.2K
R723 S	ERD25FJ122	1.2K
R724 ⚠	ERDS1FJ103	10K
CAPACITORS		
C1, 2 ⚠	ECKDKC103PF2	0.01
C3 ⚠	ECQE2A473MW	0.047
C4, 5 ⚠	ECKDKC222MF	0.0022
C6, 7 ⚠	ECKDKC222MF	0.0022
C101, 102 S	ECKD1H103ZF	0.01
C103, 104 S	ECCD1H820K	82P
C105, 106 S	ECKD1H222ZF	0.0022
C107, 108 S	ECEA0JS222	2200
C109, 110 S	ECQM1H473JZ	0.047
C111, 112 S	ECQM1H103JZ	0.01
C113, 114 S	ECQM1H332JZ	0.0033
C115, 116⚠	ECEA1EN3R3S	3.3
C117, 118 S	ECQM1H103JZ	0.01
C121, 122 S	ECEA1ES470	47
C123 S	ECKD1H223ZF	0.022
C124 S	ECKD1H333ZF	0.033
C201, 202 S	ECQM1H563JZ	0.056
C203, 204 S	ECQM1H223JZ	0.022
C205, 206 S	ECQM1H223JZ	0.022
C207, 208 S	ECQM1H183JZ	0.018
C209, 210 S	ECQM1H823JZ	0.082
C211, 212 S	ECEA25Z4R7	4.7
C213, 214 S	ECEA1HS100	10
C215, 216⚠	ECEA1EN4R7S	4.7
C217, 218 S	ECEA1HS100	10
C219 S	ECKD1H333ZF	0.033
C301, 302 S	ECKD1H681KB	680P
C303, 304 S	ECCD2H070D	7P
C305, 306 S	ECCD2H070D	7P
C307, 308 S	ECCD2H560K	56P
C309, 310⚠S	ECCD2H560K	56P
C311, 312 S	ECKD1H681KB	680P
C313, 314 S	ECKD1H681KB	680P
C317, 318 S	ECEA1AS101	100
C319, 320 S	ECEA2AS100	10
C321, 322 S	ECCD1H060CC	6P
C323 S	ECEA1JS330	33
C325, 326 S	ECCD1H101K	100P
C327, 328 S	ECQM1H473JZ	0.047
C329, 330 S	ECQM1H473JZ	0.047
C401, 402 S	ECEA1HS100	10
C403, 404⚠	ECET1JV153	15000
C405 ⚠S	ECEA1CS222	2200
C407 S	ECEA1HS100	10
C411, 412 S	ECEA1HS100	10
C503, 504 S	ECEA50Z3R3	3.3
C505 ⚠	ECEA1CN470S	47
C506 S	ECEA50Z3R3	3.3
C508 S	ECCD1H151K	150P
C510 S	ECEA1HS100	10
C511 S	ECKD1H223ZF	0.022
C512 S	ECEA1AS221	220
C513 S	ECEA1HS100	10
C514 S	ECKD1H223ZF	0.022
C521 S	ECKD1H223ZF	0.022
C522 S	ECEA1AS101	100
C523 S	ECEA50Z3R3	3.3
C601 S	ECQM1H683JZ	0.068
C602 S	ECKD1H103ZF	0.01
C603 S	ECEA25Z4R7	4.7
C604 S	ECEA50Z1	1
C701, 702 S	ECQM1H473JZ	0.047

■ REPLACEMENT PARTS LIST

Notes: 1. Part numbers are indicated on most mechanical parts. Please use this part number for parts order.
2. Important safety notice: Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
3. Ⓚ —marked parts are used for black only, while ○ —marked parts are for silver type only.
4. Part other than Ⓚ — and ○—marked are used for both black and silver type.
5. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.
6. The "**S**" mark is service standard parts and may differ from production parts.
7. The parenthesized numbers in the column of description stand for the quantity per set.

Ref. No.	Part No.	Description
INTEGRATED CIRCUITS		
IC101.201	SVINJM4560DX	Equalizer, DC Servo Amp.
IC501.502	SVITD62501P	Inverter
IC503	MN1421STA	ICQ Controller
IC701	AN6552F	Muting.
TRANSISTORS		
Q101.102.103.104	2SK369−GR	FET Differential Amp. Use in pair ranks
Q301.302.303.304	2SK117−GR	FET Differential Amp. Use in pair ranks
Q305～308.501.502	2SC1845	Differential Amp., Over Load Det.
Q309.310	2SA1123−R	Inverter
Q311.312	2SA1124−R	Pre Amp. } Use in pair ranks
Q313.314	2SC2632−R	Pre Amp. }
Q315.316.329.330.403.602.701	2SC1685−Q	Bias Control, Regulator, Relay Drive
Q317.318	2SC2631−R	Pre Drive } Use in pair ranks
Q319.320	2SA1123−R	Pre Drive }
Q321.322	2SC2592−R	Drive } Use in pair ranks
Q323.324	2SA1112−R	Drive }
Q325.326	2SC3182−R	Power Amp. } Use in pair ranks
Q327.328	2SA1265−R	Power Amp. }
Q401	2SD1265−P	Regulator
Q402	2SB941−Q	Regulator
Q404.405	2SK246−Y	Regulator
Q406 S	2SC1384Q	Regulator
Q407 S	2SA684−QNC	Regulator
Q503.504.505.508.601.604	2SA1015−Y	DC Det., ICQ Control, Invertor,
Q509.512.513.515	2SC3112	Relay Drive, Switching, Indicator Drive
Q510	2SD661−S	Indicator Drive
Q511	2SD788−D	Regulator
Q603	2SB745−S	Muting
Q605	2SA992	Relay Drive
DIODES		
D101.102.201～204.301～310.501～507.522.526.601～605.701～703.705. S	MA162A	Switching
D311.312.323～326.523	MA27W−A	Bias
D315～322.525 S	20A90	Bias
D401	SVDMZ322A	Zener, 22V
D406～409 ⚠S	SVDSR1K2	Rectifier
D410 ⚠	SVDS10VB20F	Rectifier
D411.412	SVDMZ316B	Zener, 16V
D511	SVDMZ306B	Zener, 6V
D513	LN420WP	L. E. D., Output (stand-by)
D514	LN820WP	L. E. D., Output (ON)
D515.517～521	SVDAY5533K1M	New class A Indicator
D516	SVDBG5533K−1	New class A Indicator(Auto)
D704	SVDMZ314B	Zener, 14V
COILS		
L301.302	SLQY15G−30	Choke
TRANSFORMERS		
T1 ⚠	SLT5P229	Power Source

Ref. No.	Part No.	Description
THERMISTERS		
TH301.302	ERTD2ZHL103S	10kΩ
VARIABLE RESISTORS		
VR201	EWJG2A066B15	Volume, 100kΩ(B)
VR202	EWHF5AF20G15	Balance Control, 100kΩ(G)
VR203	EWCS7A020012	Treble
VR204	EWCS6A020C15	Bass, 100kΩ(C)
VR301.302	EVNK6AA00B13	ICQ Adj., 1kΩ(B)
VR501 S	EVNM0AA00B14	Clock Adj., 10kΩ (B)
VR701.702	EVNK6AA00B53	Impedance Detector, 5kΩ(B)
COMPONENT COMBINATIONS		
Z301.302 ⚠	ERF3GBKR22N	0.22Ω(×2)
Z401.402 ⚠	SXRFS203ZSM	0.01μF(×2)
Z501	EXBP87562K	5.6kΩ(×7)
Z502	SXRPTH517F03	Temperature Det., (60°C, 100°C, 130°C)
Z503	EXBP84103J	10kΩ(×4)
Z504	EXBP84103M	10kΩ(×4)
Z505	EXBP84121M	120Ω(×4)
RELAYS		
RLY501	SSY117	Speaker Transformer Tap Select of Secondary
RLY601 ⚠	SSY109−1	
LAMPS		
PL1～3	XAMR74S10	New class A, 12V. 0.055A
FUSES		
F1 ⚠	XBA2C50TR0	250V, T5A
F2 ⚠	XBA2C25TR0	250V, T2.5A
F3 ⚠	XBA2C10TR0	250V, T1A
SWITCHES		
S1	SSH1079	Phono Selector
S2.3	ESA2682	Input Selector, Rec Selector
S4	SSH165−1	Muting
S5.6	SSH2043−1	Subsonic Filter, Loudness Control
S7	SSH1045	Operation
S8 ⚠	ESB90227S	Power Source
S9	SSR185	Speaker
S11 ⚠	ESE37219	Voltage Selector
CABINET and CHASSIS PARTS		
1	SBN1151	Knob, Speaker, Rec Selector and Input Selector (3)
2 ○	SYW641	Front panel, Ass'y (Silver) (1)
2(PA, PE) only ○	SYW639	Front Panel, Ass'y (Silver) (1)
2 Ⓚ	SYW643	Front Panel, Ass'y (Black) (1)
3	SBN1149	Knob, Volume (1)
4	SHS1011	Spacer (1)
5	SBN1153	Knob, Balance, Treble and Bass (3)
6	SBC339	Button, Phono Selector. Muting. Loudness. Subsonic Filter and Operation (5)
7	SBC337−1	Button, Power (1)
8	SJJ71B	Jack, Headphone(1)

Black type model No. : SU-V707(K)

Ref. No.	Part No.	Description
CABINET and CHASSIS PARTS		
9	SMP303	Holder, L. E. D. (1)
10 ○	SKC1130S1A	Cabinet(Silver) (1)
10 Ⓚ	SKC1130BB1	Cabinet(Black) (1)
11	SMZ313	Shield Plate (1)
12	SUW1995−2	Bracket, P. C. B.(1)
13	SMC1087	Shield Plate (1)
14	SMN1847	Bracket (1)
15	SHG6309	Rubber, Power Transformer (2)
16	SUW1811	Bracket, Electrolytic Capacitor (1)
17	SUW2083	Bracket, Power Transistor (1)
18	SMX767	Spacer, Power Transistor (1)
19	SML107−5	Bracket (1)
20(XA, PE) only	SUW1773−1	Bracket (1)
21	SJT347	Holder, Fuse (6)
22	SMX755	Insulation Plate (1)
23	SJF4815−2	Terminal Board, Speaker (1)
24(XA, PE) only ⚠	SJS601−2	Socket, AC Outlet (1)
25 Other areas	SHR127	Bushing, AC Cord (1)
25(EK)only	SHR129	Bushing, AC Cord (1)
25(XL)only	SHR131	Bushing, AC Cord (1)
26 Other areas S ⚠	SJA97	AC Cord (1)
26(EW, XA) only ⚠	SJA111	AC Cord (1)
26(EK)only S ⚠	QFC1205M	AC Cord (1)
26(XL)only S ⚠	QFC1207MA	AC Cord (1)
26(PA, PE) only S ⚠	RJA52Z	AC Cord (1)
27 Other areas	SGPUV707B	Rear Panel (1)
27(D, EW)only	SGPUV707W	Rear Panel (1)
27(XL)only	SGPUV707L	Rear Panel (1)
27(XA, PA, PE)only	SGPUV707X	Rear Panel (1)
27(EK)only	SGPUV707K	Rear Panel (1)
28	SJF3055−2N	Terminal Board (1)
29	SJP9205−2	Short Pin (2)
30	SJF3055N	Terminal Board (1)
31	ESA3380B	Remote Control, Input Selector (1)
32	ESA3379B	Remote Control, Rec Selector (1)
33	SKL249	Foot (4)
34	SKU8990−1	Bottom Board (1)
35	SDH545	Reflector Plate (1)
36	SMP335−1	Case, L. E. D. (1)
37	SUW1975	Bracket, P. C. B (Fuse) (1)
38(XL)only	RJT202B	Terminal (1)
SCREWS		
N1	XXE4D5FZS	(3)
N2	XTBS3+8BFZ1	Tapping with Detent, ⊕3×8 (28)
N3 S	XSN3+6S	⊕3×6 (8)
N4 S	XTN3+10B	Tapping, ⊕3×10(11)
N5	XTWS3+8BFZ1	Washer Head Tapping with Detent, ⊕3×8 (1)
N6 S	XSN3+10S	⊕3×10 (1)

Ref. No.	Part No.
SCREWS	
N7	XTW3+12
N8 S	XTB4+10
N9 ○	SNE2095−
N9 Ⓚ	SNE2095−
N10	XTBS3+8
N11(XL)only S	XSN3+8S
WASHERS	
N15 S	XWA3B
N16	SNE59−1
N17 S	XWG3
N18 S○	XWC4B
N18 Ⓚ	XWC4BFZ
N19(XL)only S	XWC3B
NUTS	
N20	SNE4021
N21 S	XNS12
ACCESSORIES	
A1(XA)only ⚠	SJP5213−
A2(XA)only ⚠	SJP5215
A3(PA, PE) only ⚠	SJP9215
A4 Other areas	SQF11703
A4(XA)only	SQF11707
A4(PA, PE) only	SQF11709
PACKING PARTS	
P1 ○	SPP701
P1 Ⓚ	SPP689
P2 Other areas	SPS3023
P2(EK, PA, PE)only	SPS3023
P3 Other areas	SPS3025
P3(EK, PA, PE)only	SPS3025
P4 Other areas	SPS4061
P4(EK, PA, PE)only	SPS3633
P5 ○	SPG4417
P5 Ⓚ	SPG4421
P5(EF)only	SPG4419
P5(EK, PA, PE)only	SPG4413
P6(EF)only ○	SGK1411
P6(EK)only Ⓚ	SGK1413

Areas

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*[EW] is availab
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*[XL] is availab
*[XA] is availab Africa, M South Ar
*[PA] is availab
*[PE] is availab
*[EF] is availab
*[EH] is availab
*[EB] is availab
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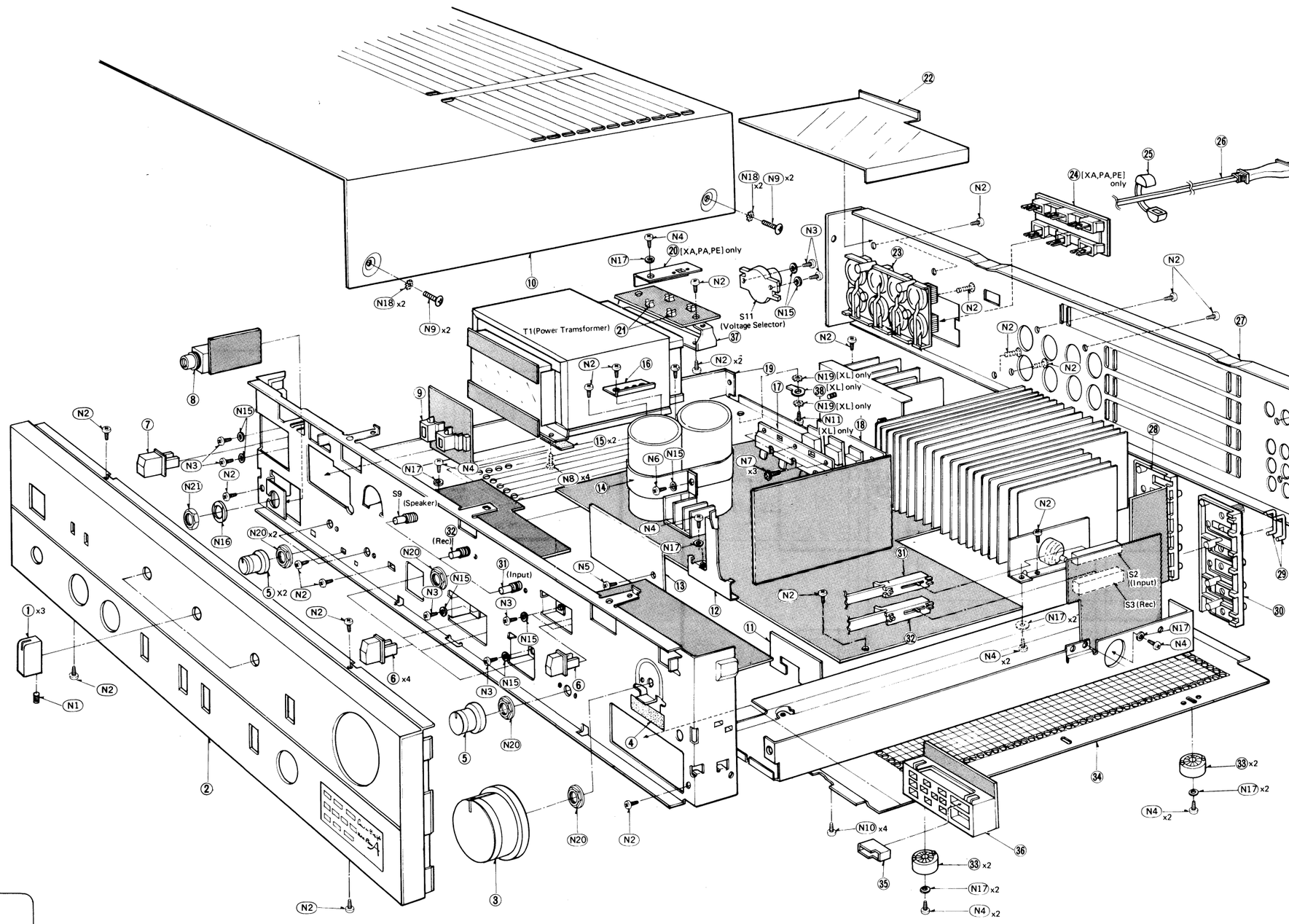
: SU-V707(K)

	Description
PARTS	
	Holder, L. E. D. (1)
	Cabinet(Silver) (1)
	Cabinet(Black) (1)
	Shield Plate (1)
	Bracket, P. C. B.(1)
	Shield Plate (1)
	Bracket (1)
	Rubber, Power Transformer (2)
	Bracket, Electrolytic Capacitor (1)
	Bracket, Power Transistor (1)
	Spacer, Power Transistor (1)
	Bracket (1)
	Bracket (1)
	Holder, Fuse (6)
	Insulation Plate (1)
	Terminal Board, Speaker (1)
	Socket, AC Outlet (1)
	Bushing, AC Cord (1)
	Bushing, AC Cord (1)
	Bushing, AC Cord (1)
	AC Cord (1)
	AC Cord (1)
	AC Cord (1)
	AC Cord (1)
	AC Cord (1)
	Rear Panel (1)
	Rear Panel (1)
	Rear Panel (1)
	Rear Panel (1)
	Rear Panel (1)
	Terminal Board (1)
	Short Pin (2)
	Terminal Board (1)
	Remote Control, Input Selector (1)
	Remote Control, Rec Selector (1)
	Foot (4)
	Bottom Board (1)
	Reflector Plate (1)
	Case, L. E. D. (1)
	Bracket, P. C. B (Fuse) (1)
	Terminal (1)
	(3)
Z1	Tapping with Detent, ⊕3×8 (20)
	⊕3×6 (8)
	Tapping, ⊕3×10(11)
Z1	Washer Head Tapping with Detent, ⊕3×8 (1)
	⊕3×10 (1)

Ref. No.	Part No.	Description
SCREWS		
N7	XTW3+12JFYR	Washer Head Tapping, ⊕3×12(3)
N8 S	XTB4+10BFN	Tapping, ⊕3×10(4)
N9 ○	SNE2095−2	Tapping(Silver) (4)
N9 Ⓚ	SNE2095−3	Tapping(Black) (4)
N10	XTBS3+8BFYR1	Tapping with Detent, ⊕3×8 (4)
N11(XL)only S	XSN3+8S	⊕3×8 (1)
WASHERS		
N15 S	XWA3B	Spring, ϕ3 (9)
N16	SNE59−1	Spring (1)
N17 S	XWG3	Plain, ϕ3 (11)
N18 S○	XWC4B	External Toothed Look, ϕ4 (4)
N18 Ⓚ	XWC4BFZ	External Toothed Look, ϕ4 (4)
N19(XL)only S	XWC3B	External Toothed Look, ϕ3 (2)
NUTS		
N20	SNE4021	Washer Head Nut (7)
N21 S	XNS12	ϕ12 (1)
ACCESSORIES		
A1(XA)only ⚠	SJP5213−1	Plug Adapter (1)
A2(XA)only ⚠	SJP5215	Plug Adapter (1)
A3(PA, PE) only ⚠	SJP9215	Plug Adapter (1)
A4 Other areas	SQF11703	Instruction Book (1)
A4(XA)only	SQF11707	Instruction Book (1)
A4(PA, PE) only	SQF11709	Instruction Book (1)
PACKING PARTS		
P1 ○	SPP701	Polyethylene Bag (1)
P1 Ⓚ	SPP689	Polyethylene Bag (1)
P2 Other areas	SPS3023−3	Pad, Left Side (1)
P2(EK, PA, PE)only	SPS3023−2	Pad, Left Side (1)
P3 Other areas	SPS3025−3	Pad, Right Side (1)
P3(EK, PA, PE)only	SPS3025−2	Pad, Right Side (1)
P4 Other areas	SPS4061	Pad, Corner (1)
P4(EK, PA, PE)only	SPS3633	Pad, Corner (1)
P5 ○	SPG4417	Carton Box (1)
P5 Ⓚ	SPG4421	Carton Box (1)
P5(EF)only	SPG4419	Carton Box (1)
P5(EK, PA, PE)only	SPG4413	Carton Box (1)
P6(EF)only ○	SGK1411	Label (2)
P6(EK)only Ⓚ	SGK1413	Label (2)

■ EXPLODED VIEW



Areas

- *[D] is available in Scandinavia.
- *[EW] is available in Switzerland.
- *[EK] is available in United Kingdom.
- *[XL] is available in Australia.
- *[XA] is available in Southeast Asia, Oceania, Africa, Middle Near East and Central South America.
- *[PA] is available in Far East PX.
- *[PE] is available in European Military.
- *[EF] is available in France.
- *[EH] is available in Holland.
- *[EB] is available in Belgium.
- *[Ei] is available in Italy.

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